DEPARTMENT OF THE NAVY – SOUTHWEST DIVISION
Naval Facilities Engineering Command

FINAL
REMEDIAL ACTION WORK PLAN

UNDERGROUND STORAGE TANK SITE 41319
MARINE CORPS BASE CAMP PENDLETON
CALIFORNIA

JUNE 4, 2004

Prepared by:
Navy Public Works Center San Diego

FINAL
REMEDIAL ACTION WORK PLAN
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Prepared for:

Department of the Navy – Southwest Division

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ABBREVIATIONS AND ACRONYMS

bgs	below ground surface
BMP	Best Management Practice
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CFR	Code of Federal Regulations
CH	chlorinated hydrocarbons
DEH	Department of Environmental Health
DHS	(California) Department of Health Services
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
FWENC	Foster Wheeler Environmental Corporation
LUFT	Leaking Underground Fuel Tank
MCB	Marine Corps Base
mg/kg	milligrams per kilogram
MEI	Minority Enterprises, Inc.
MSL	mean sea level
MTBE	methyl tert-butyl ether
PCB	polychlorinated biphenyl
PPE	personal protective equipment
PRG	Preliminary Remediation Goal
PWCSD	Navy Public Works Center, San Diego, Environmental Department
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
ROICC	Resident Officer in Charge of Construction
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SHSP	Site-Specific Health and Safety Plan
SPLP	Synthetic Precipitation Leaching Procedure
SWDIV	Southwest Division Naval Facilities Engineering Command
TPH-d	total petroleum hydrocarbons quantified as diesel

ABBREVIATIONS AND ACRONYMS
(Continued)

TPH-g	total petroleum hydrocarbons quantified as gasoline
TRPH	total recoverable petroleum hydrocarbons
UST	Underground Storage Tank

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) describes proposed soil excavation activities at Underground Storage Tank (UST) Site 41319 at Marine Corps Base (MCB) Camp Pendleton, California (Figure 1-1). This Site previously contained a UST used to store waste oil from vehicle maintenance operations. This RAWP was prepared by Navy Public Works Center, San Diego, Environmental Department (PWCSD) for the U.S. Department of the Navy, Southwest Division Naval Facilities Engineering Command (SWDIV).

1.1 OBJECTIVES

The primary objectives of this RAWP are as follows:

- Summarize the findings of sampling completed during UST removal by Minority Enterprises, Inc. (MEI) and during an Environmental Site Assessment (ESA) completed by Ninyo and Moore.
- Meet the internal objectives of MCB Camp Pendleton for reduced potential risk to hypothetical construction workers at the site.
- Meet the requirements of the California Regional Water Quality Control Board (RWQCB) and San Diego County Department of Environmental Health (DEH) for the submittal of this RAWP.

UST Site 41319 is regulated under the California Code of Regulations, Title 23, Division 3, Chapter 16, Article 11, and the California Health and Safety Code, Sections 25187 through 25189, which require those responsible for the release of hazardous substances to take all necessary corrective actions to remedy the release. The document guiding the assessment, remediation, and closure process at the site is the *San Diego County Site Assessment and Mitigation Manual 2004* (DEH, 2004). The agency performing regulatory oversight of this work is the San Diego County DEH.

Previous site investigations indicated that hydrocarbon-impacted soils and leachable metals present at the site most likely do not pose a threat to underlying groundwater. These compounds would have to migrate vertically over 45 feet through dense sandy silt before contacting groundwater. However, excavation of remaining hydrocarbon sources is proposed to mitigate any potential impact and reduce potential risk to hypothetical construction workers at the Site. This RAWP describes the remedial action proposed for soil at the Site.

1.2 SITE IDENTIFICATION

The following site identification data is provided for reference:

Site Address:	Former Building 41319, 41 Area, MCB Camp Pendleton, California 92055
Facility Name:	Vehicle Grease Rack (decommissioned)
RWQCB Case No.:	9UT2903
DEH Case No.:	H05939-145
Property Owner:	United States Marine Corps
Contact Person:	Ms. Tracy Sahagun Assistant Chief of Staff, Environmental Security Box 555008, Building 22165 Camp Pendleton, California 92055-5008 (760) 725-9774
Remedial Project Manager:	Mr. Bipin Patel, P.E. Naval Facilities Engineering Command, Southwest Division 1220 Pacific Highway San Diego, California 92132-5190 (619) 532-4814
Responsible Party:	United States Marine Corps

1.3 SITE DESCRIPTION

The site is a decommissioned (date unknown) Vehicle Grease Rack 41319 located on the north side of El Camino Real approximately 350 feet west of Fisher Road in the 41 Area. The site is at an approximate elevation of 120 feet above mean sea level (MSL). UST Site 41319 is shown with nearby Area 41 buildings in Figure 1-2. The 2,000-gallon waste oil tank, UST 41319, was removed in 1994 by Minority Enterprises, Inc. (MEI, 94).

1.4 PLAN ORGANIZATION

This RAWP is organized as follows:

- **Section 1.0 – Introduction**, includes statement of plan objectives, site identification, site description, and organization of this RAWP.
- **Section 2.0 – Previous Investigations**, summarizes the UST removal and previous investigations.
- **Section 3.0 – Assessment of Impacts**, describes the environmental setting and the nature and extent of hydrocarbon-impacted soil.

- **Section 4.0 – Proposed Interim Remedial Action**, describes the proposed soil excavation activities and presents proposed soil cleanup goals.
- **Section 5.0 – Soil Excavation Management**, describes the pre-construction, construction, and post-construction management activities for the removal of impacted soil from former UST Site 41319.
- **Section 6.0 – Waste Management,** summarizes handling and disposal methods for the excavated soil and other waste generated during project activities, including personal protective equipment (PPE), debris, soil stockpiles, and decontaminated water.
- **Section 7.0 – Data Reporting and Site Closure**, describes reporting of data following site closure.
- **Section 8.0 – References**, includes references used to prepare this document.
- **Appendix A – Sampling and Analysis Plan (SAP)**, describes field sampling procedures, quality assurance, and quality control requirements that will be used to support the soil excavation activities.
- **Appendix B** – Health and Safety Plan, describes health and safety procedures governing the proposed field activities for UST Site 41319.

2.0 PREVIOUS INVESTIGATIONS

This section presents a summary of previous investigations conducted at UST Site 41319.

2.1 UST REMOVAL

In July 1994, UST 41319 was removed by Minority Enterprises, Inc (MEI, 1994). The tank excavation was approximately 11 feet by 16 feet and extended 8 feet below ground surface (bgs). A concrete tank pad was encountered at the base of the excavation and appears to have not been removed. Groundwater was not encountered in the excavation. Following UST removal, MEI personnel collected soil samples from the western sidewall of the excavation and below the tank pad (Figure 2-1).

Each sample was analyzed for total petroleum hydrocarbons quantified as gasoline (TPH-g) and diesel (TPH-d) by modified U.S. Environmental Protection Agency (EPA) Method 8015 and total recoverable petroleum hydrocarbons (TRPH) by EPA Method 418.1.

Soil analytical results for TPH-g, TPH-d, and TRPH are summarized in Table 2-1. Soil analytical results from a sample collected adjacent to and below the former UST location reported a TPH-g concentration of 16 milligrams per kilogram (mg/kg), a TPH-d concentration of 270 mg/kg, and a TRPH concentration of 2,600 mg/kg. Information regarding the disposition of excavated soil was not available. The excavated soil may have been used to backfill the UST excavation (Ninyo & Moore, 2000).

2.2 ENVIRONMENTAL SITE ASSESSMENT

Ninyo and Moore conducted environmental site assessment field activities from November 1999 to January 2000 to evaluate the extent of impacted soils and assess groundwater quality (Ninyo and Moore, 2000). Eighteen vertical soil borings (41319-B1 through 41319-B18) were advanced to depths of up to 50 feet bgs in the vicinity of the former UST (Figure 2-1). Soil samples were collected from each boring at intervals ranging from 1 to 5 feet between samples. An attempt was made to collect a groundwater sample from a temporary well installed in boring 41319-B1 located in the former tank cavity. Groundwater was not observed in the temporary well after a 28-day period.

One hundred twenty-one soil samples were analyzed for TRPH by U.S. EPA Method 418.1. Selected soil samples, including those with the highest TRPH concentrations, were analyzed for the following constituents (Ninyo & Moore, 2000):

- TPH-g and TPH-d by U.S. EPA Method 8015M;

- Benzene, toluene, ethylbenzene, and xylenes (BTEX) and MTBE by U.S. EPA Method 8021B;
- Chlorinated hydrocarbons (CHs) by U.S. EPA Method 8021B;
- Polychlorinated byphenyls (PCBs) by U.S. EPA Method 8082;
- Organic lead by the California Department of Health Services (DHS) Leaking Underground Fuel Tank Manual (LUFT) Method; and
- Title 22 Metals (17 metals) by U.S. EPA Method 6010/7471.

In addition, selected soil sample extracts, including those with the highest TRPH concentrations, were analyzed following the Synthetic Precipitation Leaching Procedure (SPLP) for the following:

- BTEX/MTBE by U.S. EPA Method 8021B;
- CHs by U.S. EPA Method 8021B;
- PCBs by U.S. EPA Method 8082;
- Organic lead by DHS LUFT Method; and
- Title 22 Metals by U.S. EPA Method 6010/7471.

TRPH was reported in 21 of the 121 soil samples analyzed, in concentrations ranging from 16 to 60,000 mg/kg. TRPH concentrations in eight samples exceeded 1,000 mg/kg (Ninyo & Moore, 2000). TPH-d was reported in six soil samples in concentrations ranging from 18 to 3,600 mg/kg. TPH-g was reported in one soil sample at a concentration of 300 mg/kg, with hydrocarbons indicative of Stoddard solvent (Ninyo & Moore, 2000).

Toluene, ethylbenzene, and total xylenes were reported in the two soil samples with the greatest TRPH concentrations. Toluene, ethylbenzene and total xylenes concentrations were two to three orders of magnitude less than their applicable respective U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) for residential soils (U.S. EPA, December 1999).

3.0 ASSESSMENT OF IMPACTS

This section presents information on the regional and site geology and hydrogeology, as well as the nature and extent of contamination.

3.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

MCB Camp Pendleton is situated in the Peninsular Ranges Geomorphic Province. Geomorphic characteristics found in the peninsular range include mountain slopes, foothills, inland valleys, coastal valleys, coastal slopes, and coastal plains. Generally, MCB Camp Pendleton contains all these features, which slope to the west from the mountain backbone near the eastern border of the Base, with the exception of a low coastal mountain range (Foster Wheeler Environmental Corporation [FWEC], 2003).

The stratigraphy within the Base varies from east to west (Rosenberg, 1994). In the eastern mountains, a complex of presumably Cretaceous igneous intrusive and extrusive rocks intrude and overlie the Jurassic-aged sedimentary rocks of the Bedford Canyon Formation. An Upper Cretaceous marine conglomerate occurs in the more westerly mountain slopes and foothills. The Cretaceous Williams Formation occupies the foothills and inland valleys to the west of the eastern mountain range and may conformably overlie the Bedford Canyon Formation in the inaccessible artillery impact area. In the transition zone between the inland valleys and eastern slope of the coastal mountains, the Middle Eocene Santiago Formation unconformably overlies the Williams Formation and an intermittent paleosol developed on it. The Middle Miocene San Onofre Breccia unconformably overlies the Santiago Formation and forms the backbone of the coastal San Onofre Mountains. The coastal slope of these mountains is occupied by relatively small nearshore exposures of successively overlying Upper Miocene Monterey Formation, Lower Pliocene Capistrano Formation, and assorted Pleistocene Terrace Deposits. Three major river valleys contain Upper Pliocene to Holocene alluvial deposits that extend into the inland valley (FWEC, 2003).

Groundwater at MCB Camp Pendleton may be present in two types of aquifers: a shallow unconfined aquifer (Moyle, 1973) and deeper, possibly confined aquifers. Both types of aquifers may be present in the larger southwest trending valleys on the Base, such as the Santa Margarita River Valley.

3.2 SITE GEOLOGY AND HYDROGEOLOGY

UST Site 41319 is situated upon Stewart Mesa in the San Onofre/Las Flores Creek Watershed. Surface drainage at the site is towards a small, unnamed ephemeral stream located approximately 500 feet southeast of the site. The stream flows in a southwesterly direction for approximately 1.2 miles where it discharges into the Pacific Ocean. Las Flores Creek, located approximately

0.8 miles northwest of the Site, has existing beneficial uses for agricultural supply, contact and non-contact water recreation, warm and cold freshwater habitat, wildlife habitat, and rare, threatened, or endangered species habitat. The RWQCB has exempted Las Flores Creek from municipal use designation. The nearest major surface water body is the Pacific Ocean.

UST Site 41319 is underlain by several feet of fill and Quaternary aged Older Alluvium. The fill extends from near surface to approximately 6.5 feet bgs, and consists of reddish brown to gray silty sand. The Older Alluvium typically consists of reddish brown and olive gray sandy silt and clayey silt (Ninyo & Moore, 2000).

Groundwater beneath the site occurs within the Las Pulgas Hydrologic Subarea (901.52) within the San Onofre Hydrologic Area (1.50) of the San Juan Hydrologic Unit. The hydrologic area has existing groundwater beneficial uses for municipal and agricultural supply. The nearest water supply well (10/5 18M4) is located 1.1 miles northwest of the site. Groundwater was not encountered at a maximum depth of 50 feet bgs during the ESA. Groundwater was encountered at 36 feet bgs at UST Site 41312, located approximately 450 feet northwest of the site. The groundwater source at site 41312 is believed to be artificial recharge from a plugged boiler-water discharge floor drain. Groundwater flow is estimated to be in the southwestern direction, towards the Pacific Ocean (Ninyo & Moore, 2000).

3.3 NATURE AND EXTENT OF CONTAMINATION

Laboratory results indicate that subsurface contaminants are the result of hydrocarbon fuels leaking from the former UST at the site. Based on the results of previous investigations, it is conservatively estimated that the lateral extent of impacted soils extends over an area approximately 80 feet by an average 40 feet and extends vertically to variable depths to a maximum of 10 feet bgs. The estimated lateral extent of hydrocarbon-impacted soil is shown in Figure 3-1. The estimated volume of hydrocarbon-impacted soil is approximately 275 cubic yards.

4.0 PROPOSED REMEDIAL ACTION

This section describes the excavating process that will be implemented to remove impacted soil that may present a risk to potential future construction workers. Conditions at the site currently meet RWQCB criteria for a low-risk soil-only scenario (RWQCB, 1996). The proposed remedial action is elective, and is being initiated by MCB Camp Pendleton to facilitate site closure and reduce hypothetical future risk to construction workers.

4.1 OVERALL APPROACH

An estimated 275 cubic yards of soil will be excavated to achieve the remedial action cleanup goals presented in Section 4.2. This volume estimate is based on a proposed average excavation area of 80 feet by 40 feet in area to variable depths. Figure 3-1 identifies the proposed area to be excavated.

The remedial excavation will proceed with an excavator until proposed cleanup goals are obtained. A mobile laboratory will be used to perform on-site analysis for assessing cleanup goal attainment. Final excavation limits may be constrained by operational features such as the existing oil/water separator and retaining wall.

At a minimum, one confirmation soil sample will be collected for every 20 linear feet of each sidewall, and one sample will be collected from the excavation bottom. The mobile laboratory will analyze confirmation soil samples for TRPH, TPH-d, and TPH-g. The excavation will continue as practical, based on the judgment of the site geologist or engineer until the remaining soils meet applicable cleanup goals proposed in Section 4.2.

Sampling methods and analytical protocols are described in further detail in the attached Sampling and Analysis Plan (Appendix A). Because metals are typically less mobile than petroleum, TRPH, TPH-d, and TPH-g values will be used as surrogates for Title 22 metals, which may have impacted soil in the waste oil release. It should be noted that reported concentrations of metals in soil are less than MCB Camp Pendleton background values or residential PRGs.

During the ESA groundwater was not observed in a temporary well constructed at a depth of 50 feet bgs. Because of diminishing petroleum and related impacts with depth, the absence of groundwater to 50 feet bgs, and the results of SPLP analyses, it was determined that groundwater has not been and will not be, affected by shallow soil contamination at UST Site 41319 (Ninyo & Moore, 2000). Groundwater underlying UST Site 41319 will not be sampled during the soil excavation activities.

4.2 PROPOSED CLEANUP GOALS

Promulgated cleanup goals for TRPH, TPH-d, and TPH-g do not exist for soil. In accordance with San Diego County Department of Health Guidelines, MCB Camp Pendleton shall propose soil cleanup levels that ensure the following:

- remaining leachable/mobile constituents of concern do not threaten to cause groundwater or surface water to exceed applicable (water) target cleanup levels;
- remaining constituents of concern do not threaten public health through exposure to soil vapors of the soil itself; and
- remaining constituents of concern do not create fire or explosion hazards.

Although promulgated cleanup levels for TRPH and TPH in soils do not exist, guidance is available in the Leaking Underground Fuel Tank Field (LUFT) Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure (California State Water Resources Control Board, 1989). Generally, site-specific, risk-based levels have superceded guidelines specified in the LUFT Manual. In the case of UST Site 41319, analytical results from previous soil samples for petroleum constituents, VOCs, SVOCs, and metals are consistently less than residential PRGs, or applicable background values in the case of metals. UST Site 41319 already meets site-specific, risk-based criteria and meets RWQCB criteria for a low-risk soil-only site.

However, to meet MCB Camp Pendleton's objectives of reducing potential risk to hypothetical future construction workers, and expediting site closure, the following cleanup objectives are proposed.

Table 4-1. Proposed Soil Cleanup Goals

Constituent	Proposed Cleanup Goal (mg/kg)
TRPH	1,000
TPH-d	100
TPH-g	10

5.0 SOIL EXCAVATION MANAGEMENT

This section describes the pre-construction, construction, and post-construction management activities for removal of contaminated soil from former UST Site 41319.

5.1 PRE-CONSTRUCTION CONFERENCE

Prior to commencing field activities, discussions will be held with the Camp Pendleton Resident Officer in Charge of Construction (ROICC), the Assistant Chief of Staff, Environmental Security Office, potentially impacted Marines, the SWDIV Remedial Project Manager, and others as necessary to discuss and develop an understanding of the fieldwork. In addition, the Camp Pendleton ROICC will be notified in at least 12 hours in advance of initiating field activities, in accordance with MCB Camp Pendleton's 16 March 2004 contractor safety requirements.

5.2 FIELD MOBILIZATION

This task will include mobilization of field personnel and construction equipment to the site. Field personnel will include:

- Project Geologist/Site Health and Safety Specialist
- Site Superintendent
- Heavy Equipment Operators
- Laborers

Equipment that will be required includes:

- An excavator and support equipment for excavation of soil
- A front-end loader for soil stockpiling
- Trucks and/or trailers for material transportation
- Compaction equipment or excavator attachment for backfill compaction

In addition to the equipment listed above, construction activities may require the use of shovels, picks, sampling trowels, and other similar hand tools.

5.3 SITE PREPARATION

Site preparation activities include:

- Establishing traffic routes for vehicles and heavy equipment
- Installing appropriate signs
- Establishing areas for staging of equipment and materials
- Setting up personnel and equipment decontamination facilities
- Establishing other temporary facilities that may include sanitary facilities and parking areas

5.4 UTILITY CLEARANCES

On-site utility clearance surveys will be conducted to verify current site conditions including:

- Aboveground reconnaissance to identify utilities that may affect construction activities.
- Site clearance of underground utilities will be performed by the MCB Camp Pendleton, Facilities Maintenance Department.
- Underground Service Alert will be contacted prior to any invasive activities.
- The location of underground utilities in the vicinity of the proposed excavation will be verified by a subcontracted geophysical company using a variety of methods including metal-locating techniques and ground-penetrating radar.

5.5 DECONTAMINATION FACILITIES

Nondisposable sampling tools will be decontaminated prior to sampling and in between sample locations pursuant to procedures described in the SAP (Appendix A). A temporary equipment decontamination pad, consisting of a bermed polyethylene liner, may be constructed to facilitate collection of the wastewater. The pad would be used for rinsing and decontamination of all equipment that may come into contact with the contaminated soil or water. The rinsate will be collected and placed into temporary storage. Decontamination wastewater will be collected in Department of Transportation (DOT)-approved, 55-gallon drums. The wastewater will be analyzed, if necessary, profiled, and transported to an appropriate off-site permitted facility for treatment and/or disposal. Further discussion of the waste management procedures is included in Section 6.0.

Because of the potential for exposure to contaminated soil and water, provisions will be made for personnel decontamination. A decontamination station will be set up, as necessary, between the construction support area and the exclusion zone. The decontamination procedures and the

required equipment are described in the Site-Specific Health and Safety Plan (SHSP) (Appendix B). The Site Health and Safety Specialist will be responsible for maintaining compliance with the SHSP.

5.6 DELINEATION OF EXCAVATION AREA

The area designated for excavation will be clearly delineated by marking paint and/or with flags. Debris on the ground surface will be cleared and stockpiled. The location of the soil stockpile will be determined in coordination with the ROICC and the Area 41 building manager. Figure 3-1 defines the proposed area of excavation.

5.7 EXCAVATION OF SOILS

The excavation activities will begin by removing the asphalt that partially covers the excavation area. Asphalt debris will be staged on-site until transported to the Base borrow pit. Subsequently, the excavator will remove the potentially impacted soil in approximately 2-foot lifts. Excavated soil will be stockpiled on-site. Excavation will extend vertically to the approximate extent of the hydrocarbon-impacted soil, but will not breach underlying concrete. The horizontal extent of the excavation will be deemed complete when confirmation soil samples, visual observations, and the professional judgment of the site superintendent indicate that the soil contamination has been removed and the analytical results conform to the cleanup goals described in Section 4.2, or when further excavation is limited by nearby utilities, structures, or the road.

Dust control and stormwater control measures will be implemented during all phases of construction activities. Open excavations, if present, will be protected with appropriate signs and barricades when not under construction. The excavation and confirmation sampling will be completed within approximately 1 week.

5.8 SAMPLING AND ANALYSIS

Navy Public Works San Diego Code 980 personnel will conduct all of the confirmation soil sampling. A Naval Facilities Engineering Service Center-evaluated and state of California-certified mobile laboratory will conduct analyses of the samples. Detailed descriptions of analytical methods and sampling procedures are provided in the SAP (Appendix A).

5.9 WASTE HANDLING, CHARACTERIZATION, TRANSPORTATION, AND DISPOSAL

All excavated soil will be stockpiled on site for later transportation to an approved waste disposal facility. The stockpiles will be managed as temporary waste piles in compliance with the

conditions of Resolution 95-96 (RWQCB, 1995). PWC Code 980 will manage the handling, characterization, transportation, and disposal of the stockpiled soil and any other wastes generated during the excavation.

5.10 BACKFILL AND COMPACTION

The excavation will be backfilled using subcontractor-certified clean soil fill material. If SWDIV, or the Base, have any questions concerning the contents of the fill material, analytical data will be requested from the subcontractor. Engineering fill material will be placed in the excavation areas from 5 feet bgs to grade in 1-foot compacted lifts. Compaction will be measured every foot between 5 feet bgs and grade by the modified Proctor test (American Society for Testing and Materials Test Method D 1557). Dust control measures will continue throughout the backfill process as necessary. The ground surface will be restored to match pre-existing grade and conditions. The site backfill and restoration activities will be completed within approximately 2 weeks.

5.11 DEMOBILIZATION

The post-construction phase includes demobilization of equipment and personnel. Temporary facilities installed for use during construction will be removed, and the site will be restored to its prior state.

6.0 WASTE MANAGEMENT

This section summarizes handling and disposal methods for the excavated soil and other waste generated during project activities, including PPE, debris, soil stockpiles, and decon water. All wastes will be disposed of within 60 days of start of accumulation.

All waste generated from the field activities is anticipated to be non-hazardous based on prior site characterization documentation. However, until waste generated on site is determined to be non-hazardous, it will be managed in accordance with California hazardous waste regulations. All waste will be managed in accordance with appropriate Best Management Practices (BMPs) from the time of generation until it is properly disposed.

6.1 WASTE CONTAINERIZATION AND STORAGE

Waste containers will be selected based on type and quantity of wastes generated. Containers will be DOT-compliant, and will likely include drums and bins. Prior to commencing project field activities, PWC will, with approval from MCB Camp Pendleton personnel, select areas for the temporary staging and storage of waste materials.

At the time of generation, all waste containers (including containers holding non-hazardous materials) will be labeled, using indelible ink, with the following information:

- Source and location;
- Contents and quantity of material;
- Accumulation start date (the date the first drop of material was put into the container); and
- Contractor telephone number and contact name.

In addition to the requirements above, prior to formal waste classification, all containers or tanks of potentially hazardous wastes will be labeled as "Potentially Hazardous Waste – Pending Analysis." Containers determined to contain hazardous waste will be immediately marked with a completed commercial "HAZARDOUS WASTE" label, which will include the accumulation start date and other requested information.

Waste material must be classified according to California and DOT criteria before the waste classification labels are applied. Upon classification, each container will be marked and labeled as required. Trained personnel, as required by 49 Code of Federal Regulations (CFR), Section 172, Subpart H, will conduct all DOT functions.

All hazardous waste stored in containers or portable tanks (55-gallon drums, bins, or polyethylene tanks) will be kept within a pre-designated waste accumulation area. All portable tanks containing hazardous waste will include secondary containment to contain 110 percent of the volume of the tank. Where practicable, 55-gallon containers will be stored on wooden pallets and within secondary containment controls.

Containers of hazardous waste will be inspected on a weekly basis, and the inspections will be recorded in a bound logbook. Inspections will encompass evaluation for proper labeling, secure closure, the condition of each container, number of containers, and condition of the storage area. Any signs of deterioration, leaking, or dents will be noted, and containers will be immediately overpacked, if necessary.

Portable tanks deemed to contain hazardous waste will be inspected on a daily basis and the inspections will be logged in a bound logbook. Inspections will encompass the following: 1) overfill/spill control equipment (spill kit) to ensure that it is in good working order, 2) the construction materials and the area immediately surrounding the tank system including secondary containment structures (dikes) to detect erosion or signs of releases of tank contents, and 3) proper labeling and secure closure.

6.1.1 Waste Accumulation Areas

Based on existing site characterization data all waste generated is anticipated to be non-hazardous. In the event that waste is determined to be hazardous, the waste storage will also require:

- A sign with "Danger Hazardous Waste Area-Unauthorized Personnel Keep Out," written in English and Spanish and posted at each hazardous waste accumulation area in sufficient numbers to be seen from any approach. The signs will be legible from a distance of at least 25 feet.
- Aisle space maintained to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless aisle space is not needed for any of these purposes.
- Emergency equipment (for example, fire extinguisher, spill kit, and so forth) to be located or available to personnel during active waste management activities at each accumulation area.

6.1.2 Soil Stockpiles and Staging Piles

Soil excavated during this project will be stockpiled in lined and bermed stockpile areas prior to off-site disposal. The soil will be managed in accordance with the applicable federal and state

requirements. Based on existing site characterization data, soil stockpiles and staging piles will be classified as non- Resource Conservation and Recovery Act (RCRA), non-hazardous waste.

The accumulation of TPH-contaminated soils (which are not hazardous) in stockpiles or waste piles is considered a temporary discharge by the San Diego RWQCB. Under RWQCB Resolution 95-96 (RWQCB, 1995), the RWQCB allows for a waiver from obtaining a Waste Discharge Requirements Permit through the filing of a Stockpile Waiver Certification Form and the compliance with certain specific requirements as outlined in Appendix D of the Basin Plan (RWQCB, 1994). The requirements include: submittal of the Stockpile Waiver Certification Form, maximum storage of 90 days, run-on and runoff control, inspections, protection from a 100-year storm, underlying and covering stockpiles with minimum 10-mil polyethylene liner, notification of the RWQCB Executive Officer concerning discharge of ponded water, and compliance with applicable local agency requirements.

In addition to the aforementioned requirements, the State Water Resources Control Board Policy Number 99-08, which pertains to the control of stormwater discharges from construction activities, may also be relevant and appropriate to the temporary storage of stockpiles/materials. Appropriate BMPs will be implemented to protect stockpiles from erosion and from stormwater run-on and runoff. These BMPs include erosion control, stormwater drainage control, secondary containment, fugitive emissions and wind dispersion control, and spill prevention.

6.2 PPE, DEBRIS, AND LIQUIDS DISPOSAL

All used PPE will be stored in trash bags and later disposed of at a proper landfill. Contaminated debris will be sent along with soil for appropriate off-site disposal. Wastewater will be sampled and analyzed, as necessary, and transported to an appropriate off-site disposal and/or recycling facility.

6.3 SOIL DISPOSAL

Waste generated from the project will be evaluated pursuant to the (RCRA) hazardous waste exclusions under 40 CFR, Part 261.4 for petroleum-related waste generated from UST projects. Disposal may be a combination of options determined by the results of analyses and hazardous classifications as follows:

- Although not anticipated to be present, any soil classified as RCRA hazardous waste will be transported to a licensed treatment, storage, and disposal facility for treatment, if necessary, and disposal.
- Any soil classified as non-RCRA hazardous waste will be transported for disposal to a licensed hazardous waste landfill facility.

- Soil classified as non-hazardous waste or inert will be transported for disposal to a licensed landfill or soil treatment facility permitted to accept the material.

All non-hazardous or hazardous waste manifests and profiles, along with analytical data, will be routed, once approved by PWCSD personnel, through the Assistant Chief of Staff/Environmental Security Office, MCB Camp Pendleton, for signature. Original copies of the manifest packages will be provided to the transporter for shipment. All wastes will be transported via a licensed transporter. All waste disposal facilities and transporters will be approved by PWC Code 980.

7.0 DATA REPORTING AND SITE CLOSURE

Upon successful completion of soil excavation activities, a soil excavation report will be prepared. Upon demonstration of cleanup goals attainment, to the extent feasible, site closure will be recommended.

8.0 REFERENCES

California State Water Resources Control Board, 1989. *Leaking Underground Fuel Tank Field (LUFT) Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure.*

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U. S. Environmental Protection Agency (U.S. EPA), 1999. *Region 9 Preliminary Remediation Goals (PRGs).*

TABLES

TABLE 2-1 – SUMMARY OF HISTORICAL SOIL SAMPLE RESULTS
UST SITE 41319

Sample Location	Sample ID	Date Sampled	Depth (feet bgs)	TRPH (mg/kg)	TPH-G (mg/kg)	TPH-D (mg/kg)	BTEX/MTBE (mg/kg)	Source
UST Excavation	41319-T1-12'	26-Jul-94	12.0	ND	ND	ND	--	A
	41319-T2-11'	26-Jul-94	11.0	ND	ND	ND	--	A
	41319-T3-10'	26-Jul-94	10.0	**2,600**	**16**	**270**	--	A
Boring 41319-B1	41319-B1-02.5	9-Nov-99	2.5	**680**	--	--	--	B
	41319-B1-05	9-Nov-99	5	**1,300[1]**	ND	**150[2]**	ND	B
	41319-B1-07.5	9-Nov-99	7.5	**450**	--	--	--	B
	41319-B1-10	9-Nov-99	10	**44**	ND	ND	ND	B
	41319-B1-12.5	9-Nov-99	12.5	ND	ND	ND	--	B
	41319-B1-15	9-Nov-99	15	ND	ND	ND	--	B
	41319-B1-20	9-Nov-99	20	ND	--	--	--	B
	41319-B1-25	9-Nov-99	25	ND	--	--	--	B
	41319-B1-30	9-Nov-99	30	ND	--	--	--	B
	41319-B1-35	9-Nov-99	35	ND	--	--	--	B
	41319-B1-40	9-Nov-99	40	ND	--	--	--	B
	41319-B1-45	9-Nov-99	45	ND	--	--	--	B
	41319-B1-50	9-Nov-99	50	ND	--	--	--	B
Boring 41319-B2	41319-B2-02.5	9-Nov-99	2.5	**8000[1]**	**300[3]**	**180[2]**	toluene **0.29** ethylbenzene **0.34** xylenes **1.5**	B
	41319-B2-05	9-Nov-99	5	1100	--	--	--	B
	41319-B2-07.5	9-Nov-99	7.5	ND	ND	ND	--	B
	41319-B2-10	9-Nov-99	10	ND	ND	ND	--	B
	41319-B2-15	9-Nov-99	15	ND	--	--	--	B
	41319-B2-20	9-Nov-99	20	ND	--	--	--	B
Boring 41319-B3	41319-B3-01.5	22-Nov-99	1.5	ND	--	--	--	B
	41319-B3-02.5	22-Nov-99	2.5	ND	--	--	--	B
	41319-B3-05	22-Nov-99	5	ND	--	--	--	B
	41319-B3-07.5	22-Nov-99	7.5	ND	--	--	--	B
	41319-B3-10	22-Nov-99	10	ND	--	--	--	B
	41319-B3-12.5	22-Nov-99	12.5	ND	--	--	--	B
	41319-B3-15	22-Nov-99	15	ND	--	--	--	B
	41319-B3-17.5	22-Nov-99	17.5	ND	--	--	--	B
	41319-B3-20	22-Nov-99	20	ND	--	--	--	B

TABLE 2-1 – SUMMARY OF HISTORICAL SOIL SAMPLE RESULTS
UST SITE 41319

Sample Location	Sample ID	Date Sampled	Depth (feet bgs)	TRPH (mg/kg)	TPH-G (mg/kg)	TPH-D (mg/kg)	BTEX/MTBE (mg/kg)	Source
Boring 41319-B4	41319-B4-02.5	22-Nov-99	2.5	**2,500[1](2,300[1])**	ND(ND)	ND(ND)	ND(ND)	B
	41319-B4-05	22-Nov-99	5	**1,900[1]**	--	--	--	B
	41319-B4-07.5	22-Nov-99	7.5	ND	--	--	--	B
	41319-B4-10	22-Nov-99	10	ND	--	--	--	B
	41319-B4-12.5	22-Nov-99	12.5	ND	--	--	--	B
	41319-B4-15	22-Nov-99	15	ND	--	--	--	B
	41319-B4-17.5	22-Nov-99	17.5	ND	--	--	--	B
	41319-B4-20	22-Nov-99	20	ND	--	--	--	B
Boring 41319-B5	41319-B5-02.5	22-Nov-99	2.5	**58**	--	--	--	B
	41319-B5-05	22-Nov-99	5	ND	--	--	--	B
	41319-B5-07.5	22-Nov-99	7.5	ND	--	--	--	B
	41319-B5-10	22-Nov-99	10	ND	--	--	--	B
	41319-B5-15	22-Nov-99	15	ND	--	--	--	B
	41319-B5-20	22-Nov-99	20	ND(ND)	--	--	--	B
Boring 41319-B6	41319-B6-01	22-Nov-99	1	**6,000[1]**	ND	**3,600**	ethylbenzene **0.077** xylenes **0.22**	B
	41319-B6-02.5	22-Nov-99	2.5	ND	--	--	--	B
	41319-B6-05	22-Nov-99	5	ND	--	--	--	B
	41319-B6-07.5	22-Nov-99	7.5	ND	--	--	--	B
	41319-B6-10	22-Nov-99	10	ND	--	--	--	B
	41319-B6-15	22-Nov-99	15	ND	--	--	--	B
	41319-B6-20	22-Nov-99	20	ND	--	--	--	B
Boring 41319-B7	41319-B7-01.5	22-Nov-99	1.5	ND	--	--	--	B
	41319-B7-02.5	23-Nov-99	2.5	ND	--	--	--	B
	41319-B7-05	23-Nov-99	5	ND	--	--	--	B
	41319-B7-10	23-Nov-99	10	ND	--	--	--	B
	41319-B7-15	23-Nov-99	15	ND	--	--	--	B
	41319-B7-20	23-Nov-99	20	ND	--	--	--	B

TABLE 2-1 – SUMMARY OF HISTORICAL SOIL SAMPLE RESULTS
UST SITE 41319

Sample Location	Sample ID	Date Sampled	Depth (feet bgs)	TRPH (mg/kg)	TPH-G (mg/kg)	TPH-D (mg/kg)	BTEX/MTBE (mg/kg)	Source
Boring 41319-B8	41319-B8-01.5	23-Nov-99	1.5	**160**	ND	ND	ND	B
	41319-B8-02.5	23-Nov-99	2.5	ND	--	--	--	B
	41319-B8-05	23-Nov-99	5	ND	--	--	--	B
	41319-B8-10	23-Nov-99	10	ND	--	--	--	B
	41319-B8-20	23-Nov-99	20	ND(ND)	--	--	--	B
Boring 41319-B9	41319-B9-01.5	23-Nov-99	1.5	**810**	ND	ND	ND	B
	41319-B9-02.5	23-Nov-99	2.5	ND	--	--	--	B
	41319-B9-05	23-Nov-99	5	ND	--	--	--	B
	41319-B9-10	23-Nov-99	10	ND	--	--	--	B
	41319-B9-15	23-Nov-99	15	ND	--	--	--	B
	41319-B9-20	23-Nov-99	20	ND	--	--	--	B
Boring 41319-B10	41319-B10-01.5	23-Nov-99	1.5	**810**	--	--	--	B
	41319-B10-02.5	23-Nov-99	2.5	**60,000**[2]	ND	**3,300**[1]	toluene **0.21** ethylbenzene **0.45** xylenes **1.5**	B
	41319-B10-05	23-Nov-99	5	ND	--	--	--	B
	41319-B10-10	23-Nov-99	10	ND	--	--	--	B
	41319-B10-15	23-Nov-99	15	ND	--	--	--	B
	41319-B10-20	23-Nov-99	20	ND	--	--	--	B
Boring 41319-B11	41319-B11-01.5	23-Nov-99	1.5	**16(23)**	--	--	--	B
	41319-B11-02.5	23-Nov-99	2.5	ND	--	--	--	B
	41319-B11-05	23-Nov-99	5	ND	--	--	--	B
	41319-B11-10	23-Nov-99	10	ND	--	--	--	B
	41319-B11-15	23-Nov-99	15	ND	--	--	--	B
	41319-B11-20	23-Nov-99	20	ND	--	--	--	B
Boring 41319-B12	41319-B12-01	2-Dec-99	1	ND	--	--	--	B
	41319-B12-02.5	2-Dec-99	2.5	ND	--	--	--	B
	41319-B12-05	2-Dec-99	5	ND	--	--	--	B
	41319-B12-10	2-Dec-99	10	ND	--	--	--	B
	41319-B12-15	2-Dec-99	15	ND	--	--	--	B
	41319-B12-20	2-Dec-99	20	ND(ND)	--	--	--	B

TABLE 2-1 – SUMMARY OF HISTORICAL SOIL SAMPLE RESULTS
UST SITE 41319

Sample Location	Sample ID	Date Sampled	Depth (feet bgs)	TRPH (mg/kg)	TPH-G (mg/kg)	TPH-D (mg/kg)	BTEX/MTBE (mg/kg)	Source
Boring 41319-B13	41319-B13-02.5	2-Dec-99	2.5	ND	--	--	--	B
	41319-B13-05	2-Dec-99	5	ND	--	--	--	B
	41319-B13-10	2-Dec-99	10	ND	--	--	--	B
	41319-B13-15	2-Dec-99	15	ND	--	--	--	B
	41319-B13-20	2-Dec-99	20	ND	--	--	--	B
Boring 41319-B14	41319-B14-02.5	2-Dec-99	2.5	**420**	--	--	ND	B
	41319-B14-05	2-Dec-99	5	ND	--	--	--	B
	41319-B14-10	2-Dec-99	10	ND	--	--	--	B
	41319-B14-15	2-Dec-99	15	ND	--	--	--	B
	41319-B14-20	2-Dec-99	20	ND	--	--	--	B
Boring 41319-B15	41319-B15-01.5	6-Dec-99	1.5	ND	--	--	--	B
	41319-B15-02.5	6-Dec-99	2.5	ND	--	--	--	B
	41319-B15-03.5	6-Dec-99	3.5	ND	--	--	--	B
	41319-B15-04.5	6-Dec-99	4.5	ND	--	--	--	B
	41319-B15-05.5	6-Dec-99	5.5	ND	--	--	--	B
	41319-B15-06.5	6-Dec-99	6.5	ND	--	--	--	B
	41319-B15-07.5	6-Dec-99	7.5	ND	--	--	--	B
Boring 41319-B16	41319-B16-01.5	6-Dec-99	1.5	ND	--	--	--	B
	41319-B16-02.5	6-Dec-99	2.5	ND	--	--	--	B
	41319-B16-03.5	6-Dec-99	3.5	ND	--	--	--	B
	41319-B16-04.5	6-Dec-99	4.5	ND	--	--	--	B
	41319-B16-05.5	6-Dec-99	5.5	ND	--	--	--	B
	41319-B16-06.5	6-Dec-99	6.5	ND	--	--	--	B
	41319-B16-07.5	6-Dec-99	7.5	ND	--	--	--	B
Boring 41319-B17	41319-B17-01	6-Dec-99	1	**24**	--	--	--	B
	41319-B17-02	6-Dec-99	2	ND	--	--	--	B
	41319-B17-03	6-Dec-99	3	ND	--	--	--	B
	41319-B17-04	6-Dec-99	4	ND	--	--	--	B
	41319-B17-05	6-Dec-99	5	ND(ND	--	--	--	B

TABLE 2-1 – SUMMARY OF HISTORICAL SOIL SAMPLE RESULTS
UST SITE 41319

Sample Location	Sample ID	Date Sampled	Depth (feet bgs)	TRPH (mg/kg)	TPH-G (mg/kg)	TPH-D (mg/kg)	BTEX/MTBE (mg/kg)	Source
Boring 41319-B18	41319-B18-01.5	7-Jan-00	1.5	**1,100**	--	**78**	--	B
	41319-B18-02.5	7-Jan-00	2.5	**380**	--	ND	--	B
	41319-B18-03.5	7-Jan-00	3.5	**690**	--	**18**	--	B
	41319-B18-04.5	7-Jan-00	4.5	**190**	--	ND	--	B
	41319-B18-05.5	7-Jan-00	5.5	ND	--	ND	--	B
	41319-B18-06.5	7-Jan-00	6.5	ND	--	ND	--	B
	41319-B18-07.5	7-Jan-00	7.5	ND	--	ND	--	B
	41319-B18-08	7-Jan-00	8	ND	--	ND	--	B
Detection Limits				10	*	10	*	

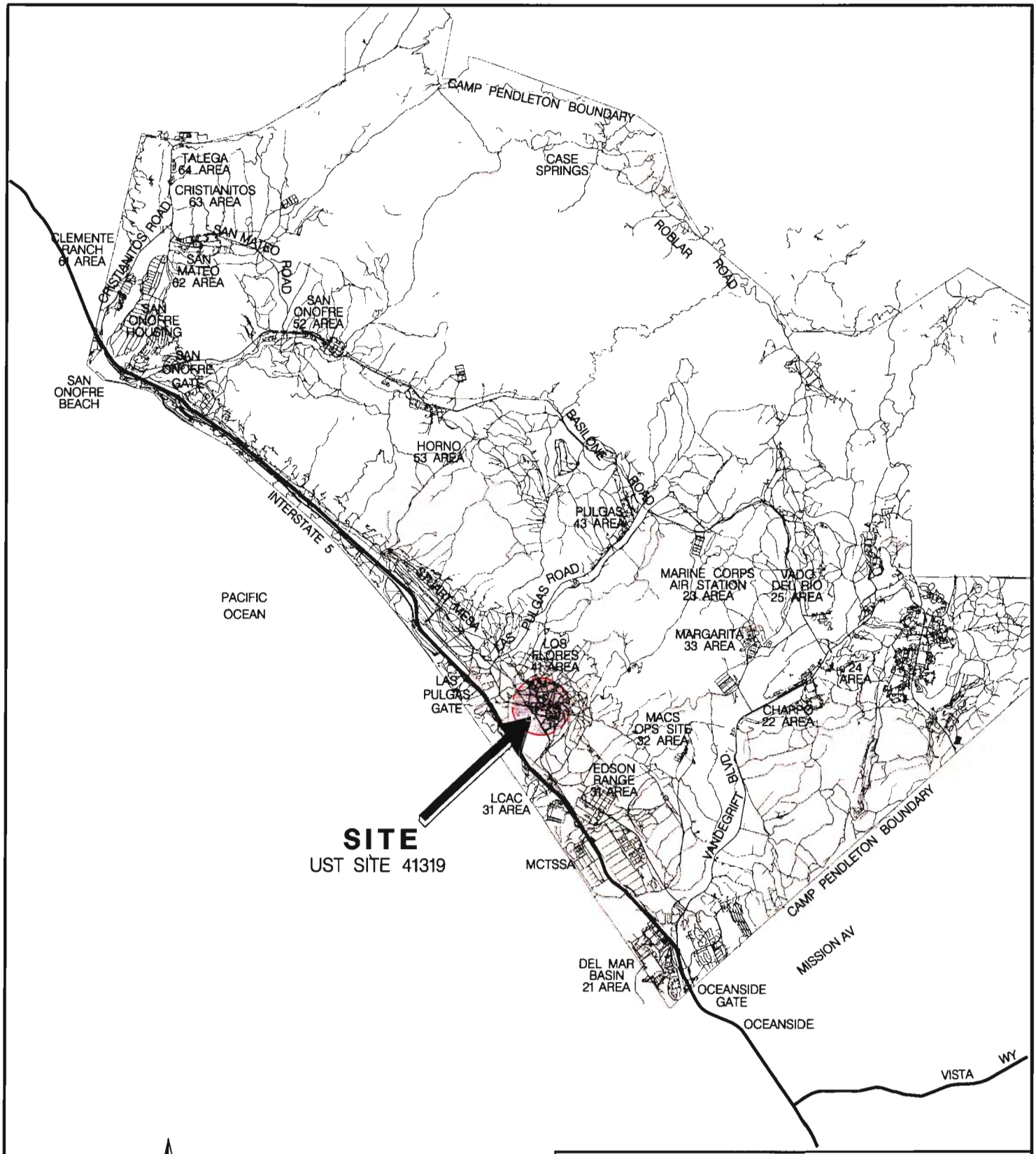
NOTES:

bgs	Below ground surface.
mg/kg	Milligrams per kilogram.
BTEX/MTBE	Benzene, toluene, ethylbenzene, xylenes, and methyl-tert-butyl ether by USEPA test method 8021.
ND	Analyte not detected at or above method detection limit.
TPH-D	Total petroleum hydrocarbons as diesel fuel by modified USEPA test method 8015.
TPH-G	Total petroleum hydrocarbons as gasoline by modified USEPA test method 8015.
TRPH	Total recoverable petroleum hydrocarbons by USEPA test method 418.1.
'	Detectionn level increased 10 times due to sample dilution.
-	Hydrocarbons present in diesel-range indicative of unknown heavy hydrocarbons.
,	Hydrocarbons present in gasoline-range indicative of stoddard solvent.
( )	Laboratory duplicate analysis.
*	Refer to laboratory reports for detection limits.

SOURCES:

A	Minority Enterprises Inc. (M.E.I) data, dated 26 July 94.
B	Ninyo & Moore field assessment November 1999 through January 2000.

FIGURES



SITE LOCATION

UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/21/2004
File No. isl081.dgn

FIGURE 1–1

z:\islaiwa\isl0b...dgn

N

0 300 600

SCALE IN FEET

FORMER UST 41319
2,000-GALLON WASTE
OIL UST (REMOVED)

41253
41255
41327
41312
41362
41366
41303
EL CAMINO REAL
41319
41359
41348
41352
41356
41346
41344
41342
41350
41372
41371
41375
STUART MESA RD

SOURCE: NINYO & MOORE, 2000

SITE PLAN

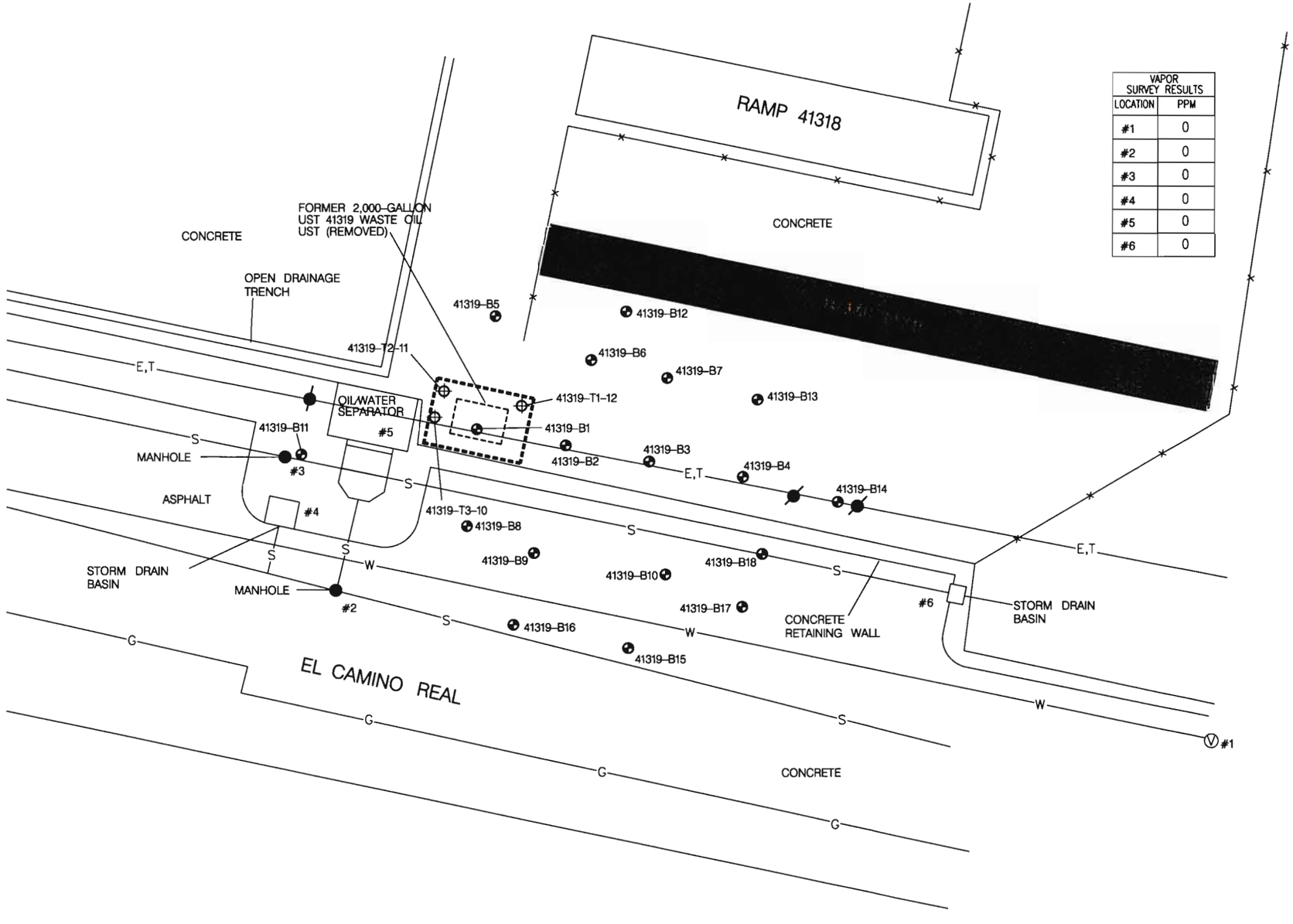
UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/21/2004
File No. isl082.dgn

FIGURE 1-2

z:\isla\wa\isl06...gn



VAPOR SURVEY RESULTS	
LOCATION	PPM
#1	0
#2	0
#3	0
#4	0
#5	0
#6	0

LEGEND

——W——S——	APPROXIMATE LOCATION OF UNDERGROUND STORM DRAIN/SEWER OR WATER LINE
---------G---------	APPROXIMATE LOCATION OF UNDERGROUND GAS LINE
C,E,T (ABOVEGROUND)	APPROXIMATE LOCATION OF ELECTRICAL TELEPHONE, OR CABLE TV CONDUIT
●	UTILITY POLE
Ⓥ	VAULT
▬▬▬	APPROXIMATE LIMITS OF FORMER UST EXCAVATION
—×—×—	FENCE
⊕	SOIL SAMPLE LOCATION (M.E.I., JULY 94)
⊕	SOIL BORING (NINYO & MOORE, NOV/DEC 1999 AND JAN 2000)
PPM	PARTS PER MILLION
VAPOR SURVEY RESULTS	MEASUREMENTS COLLECTED ON 28 APRIL 99 USING A PHOTOVAC 2020 PHOTOIONIZATION DETECTOR

N

0 20 40

SCALE IN FEET

SOURCE: NINYO & MOORE, 2000

PREVIOUS INVESTIGATION SAMPLE LOCATIONS

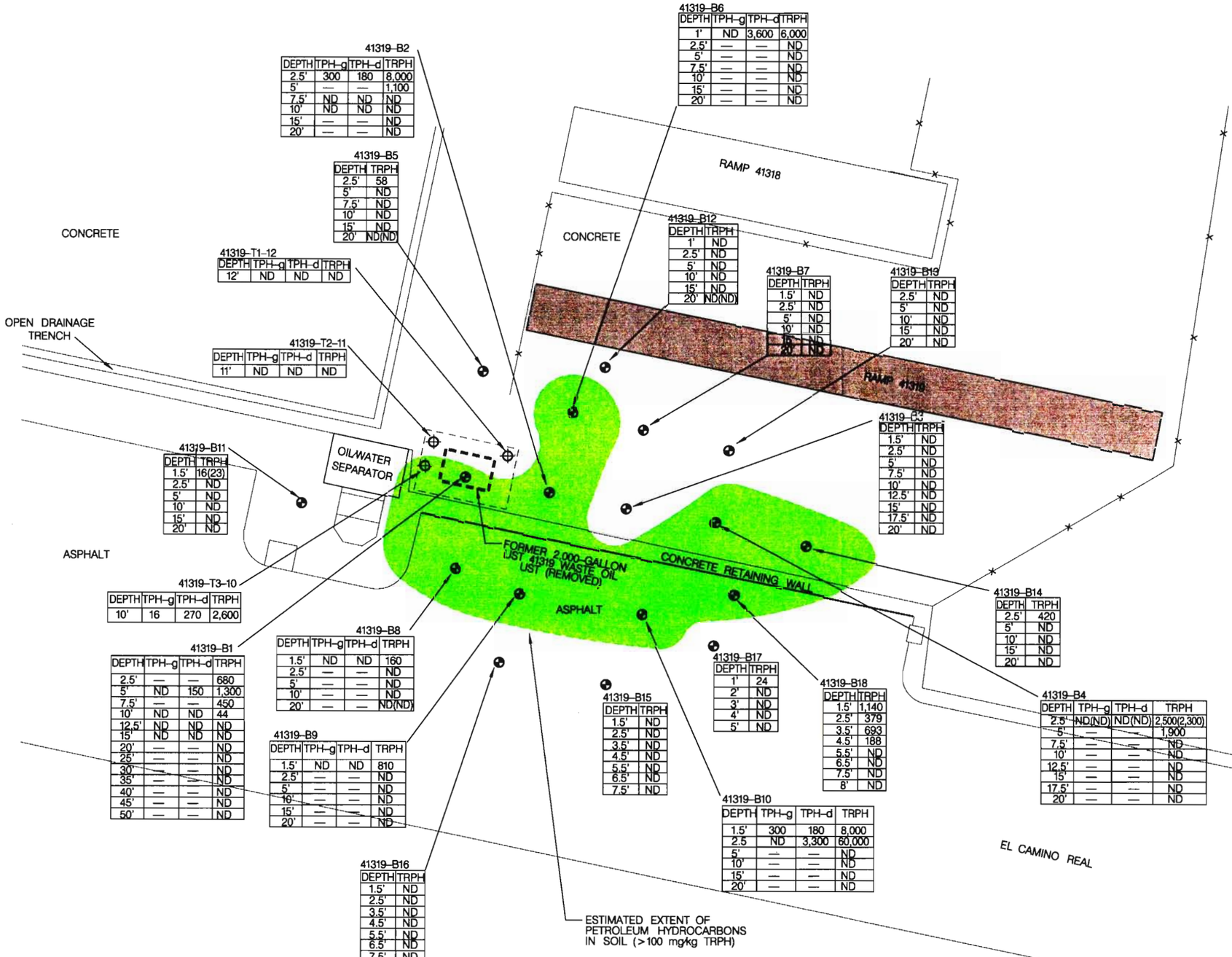
UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/21/2004
File No. isl083.dgn

FIGURE 2-1

z:\islaiwa\isl06.jgn



SOURCE: NINYO & MOORE, 2000

PREVIOUS SOIL SAMPLE ANALYTICAL RESULTS AND ESTIMATED EXTENT OF IMPACT

UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/21/2004
File No. isl064.dgn

FIGURE 3-1

z:\islaiwa\isl0L gn

DEPARTMENT OF THE NAVY – SOUTHWEST DIVISION

Naval Facilities Engineering Command

FINAL

SAMPLING AND ANALYSIS PLAN

FIELD SAMPLING PLAN/

QUALITY ASSURANCE PROJECT PLAN

UST SITE 41319

MARINE CORPS BASE CAMP PENDLETON

CALIFORNIA

JUNE 4, 2004

Prepared by:

Navy Public Works Center San Diego

FINAL
SAMPLING AND ANALYSIS PLAN
(FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN)
UST SITE 41319
MARINE CORPS BASE CAMP PENDLETON
CALIFORNIA

Prepared for:

Department of the Navy – Southwest Division

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Nars Ancog	QA Officer	SWDIV	1

TABLE A1-1
EPA QA/R-5 QAPP ELEMENTS

U.S. EPA QA/R-5 QAPP ELEMENT		UST SITE 41319 SAP	
A1	Title and Approval Sheet	Title and Approval Sheet	
A2	Table of Contents	Table of Contents	
A3	Distribution List	Distribution List	
A4	Project/Task Organization	1.4	Project Organization
A5	Problem Definition/Background	1.1	Background and Problem Definition
A6	Project/Task Description	1.3	Project and Task Description
A7	Quality Objectives and Criteria	8.1	Quality Objectives and Criteria for Measurement
A8	Special Training/Certification	1.4	Special Training and Certification
A9	Documents and Records	1.5	Documents and Records
B1	Sampling Process Design	4.0	Sampling Process Design
B2	Sampling Methods	4.1	Sampling Methods
B3	Sample Handling and Custody	4.2	Sample Handling and Custody
B4	Analytical Methods	5.1	Analytical Methods
B5	Quality Control	8.0	Quality Control
B6	Instrument/Equipment Testing, Inspection, and Maintenance	8.7	Equipment Testing, Inspection, and Maintenance
B7	Instrument/Equipment Calibration and Frequency	8.7	Instrument Calibration and Frequency
B8	Inspection/Acceptance of Supplies and Consumables	8.8	Inspection and Acceptance of Supplies and Consumables
B9	Non-direct Measurements	8.9	Non-Direct Measurements
B10	Data Management	9.0	Data Management
C1	Assessment and Response Actions	10.1	Assessment and Response Actions
C2	Reports to Management	10.2	Reports to Management
D1	Data Review, Verification, and Validation	9.2	Data Review, Verification, and Validation
D2	Validation and Verification Methods		
D3	Reconciliation with User Requirements	9.3	Reconciliation with User Requirements

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ABBREVIATIONS AND ACRONYMS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
°C	degrees Celsius
%D	percent difference
%R	percent recovery
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CCC	calibration check compound
CCV	continuing calibration verification
COC	chain-of-custody
DEH	Department of Environmental Health
DHS	Department of Health Services
DoD	Department of Defense
DON	Department of the Navy
DQO	data quality objective
EDCC	Electronic Data Consistency Checker
EDD	electronic data deliverable
EDF	electronic data format
EPA	U.S. Environmental Protection Agency
ETBE	ethyl tert-butyl ether
EWI	Environmental Work Instruction
PWCSD	Navy Public Works Center San Diego, Environmental Department
GC/MS	gas chromatograph/mass spectrometer
HCl	hydrochloric acid
ICAL	initial calibration
ICV	initial calibration verification
RAWP	Remedial Action Work Plan
LCS	laboratory control sample
MB	method blank
MCB	Marine Corps Base
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
MTBE	methyl tert-butyl ether
N/A	not applicable
ND	not detected
NE	not established
NFESC	Naval Facilities Engineering Service Center

ABBREVIATIONS AND ACRONYMS

(Continued)

PARCC	precision, accuracy, representativeness, completeness, and comparability
PID	photoionization detector
PPE	personal protective equipment
PWCSD	Public Works Center San Diego
QA	quality assurance
QC	quality control
RF	response factor
RL	reporting limit
RPD	relative percent difference
SAM	Site Assessment and Mitigation
SAP	Sampling and Analysis Plan
SOP	standard operating procedure
SPCC	system performance check compound
SWDIV	Southwest Division Naval Facilities Engineering Command
SWRCB	State Water Resources Control Board
TAME	tert-amyl methyl ether
TBA	tert-butyl alcohol
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
UST	Underground Storage Tank
VOC	volatile organic compound

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) was prepared by Public Works Center San Diego (PWCSD) to support sampling activities at former Underground Storage Tank (UST) Site 41319 at the Marine Corps Base (MCB) Camp Pendleton, California (Figures 1-1 and 1-2). The SAP was prepared on behalf of the Southwest Division Naval Facilities Engineering Command (SWDIV). This project-specific SAP includes the Field Sampling Plan and the Quality Assurance Project Plan required for this project.

The purpose of this SAP is to provide the field sampling procedures, quality assurance (QA), quality control (QC) requirements, and data gathering methods that will be used to support soil remediation activities identified in the Remedial Action Work Plan (RAWP) (PWCSD, 2004). The SAP will be used by field and laboratory personnel as a reference document during sampling and analysis. Data quality objectives (DQOs) are also described in this SAP.

The QA elements of this SAP comply with the U.S. *Environmental Protection Agency (EPA) Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS* (EPA), 2001] to ensure that all data collected are precise, accurate, representative, complete, and comparable to meet their intended use. Table A.1-1 presents the comparison of the required elements and the corresponding sections in this SAP. If any activities or analyses are required to complete this project that have not been included in this SAP, this plan will be amended and resubmitted for approval.

The regulatory agency performing the oversight of this project is the San Diego County Department of Environmental Health (DEH). This site is administered under the UST program and remedial action work is supported by UST funding.

1.1 BACKGROUND AND PROBLEM DEFINITION

The primary objective of this project is to remediate petroleum hydrocarbon-impacted soil at the former UST Site 41319 at MCB Camp Pendleton. The sampling and analysis objectives to obtain the successful completion of the site remediation activities are as follows:

- Excavate soil impacted with waste oil and petroleum hydrocarbons (approximately 275 cubic yards).
- Collect confirmation soil samples after soil excavation to determine if excavation is complete.
- Perform sampling of project-derived wastes for disposal purposes, as necessary.

1.2 PROPOSED CLEANUP GOALS

Promulgated cleanup levels for Total Recoverable Petroleum Hydrocarbons (TRPH) and Total Petroleum Hydrocarbons (TPH) in soils do not exist, although guidance is available in the Leaking Underground Fuel Tank Field (LUFT) Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure (California State Water Resources Control Board, 1989). Generally, site-specific, risk-based levels have superceded guidelines specified in the LUFT Manual. In the case of UST Site 41319, analytical results from previous soil samples for petroleum constituents, VOCs, SVOCs, and metals are consistently less than residential PRGs, or applicable background values in the case of metals. UST Site 41319 already meets site-specific, risk-based criteria and meets RWQCB criteria for a low-risk soil-only site.

However, to meet MCB Camp Pendleton's objectives of reducing potential risk to hypothetical future construction workers, and expediting site closure, the following cleanup objectives are proposed.

Table A.1-2
Proposed Cleanup Goals

Constituent	Proposed Cleanup Goal (mg/kg)
TRPH	1,000
TPH-d	100
TPH-g	10

1.3 PROJECT AND TASK DESCRIPTION

As previously stated, the primary objective of this project is to remediate petroleum hydrocarbon-impacted soil at the former UST Site 41319 at MCB Camp Pendleton. The sampling and analysis objectives to obtain the successful completion of the site remediation activities are as follows:

- Excavate soil impacted with waste oil and petroleum hydrocarbons (approximately 275 cubic yards).
- Collect confirmation soil samples after soil excavation to determine if excavation is complete.
- Perform sampling of project-derived wastes for disposal purposes, as necessary.

1.4 PROJECT ORGANIZATION

This section identifies the key individuals from MCB Camp Pendleton, SWDIV and PWCSD who are responsible for the oversight and/or implementation of the proposed field activities. The responsibilities of the team members associated with the sampling activities are presented in Figure A.1-1.

The following is a list of the key contacts for the project:

Table A.1-3

Personnel and Responsibilities

Agency	Contact	Title
Southwest Division Naval Facilities Engineering Command 1220 Pacific Highway San Diego, CA 92132-5190	Mr. Bipin Patel, P.E. (619) 532-4814	Remedial Project Manager
Southwest Division Naval Facilities Engineering Command 1220 Pacific Highway San Diego, CA 92132-5190	Mr. Narciso A. Ancog (619) 532-2540	Quality Assurance Officer
MCB Camp Pendleton ROICC Office Building 22101 Camp Pendleton, CA 92055-5229	Mr. Yusef Abdul-Rashad (760) 725-3399	Naval Technical Representative/ Resident Officer in Charge of Construction
Public Works Center, Code 980 2730 McKean St. Ste 1 San Diego, CA 92136-5294	Ms. Karen Collins (619) 524-0515	Project Manager
Public Works Center, Code 980 2730 McKean St. Ste 1 San Diego, CA 92136-5294	Mr. Craig Haverstick (619) 517-4178	Project Health and Safety Manager
Public Works Center, Code 980 2730 McKean St. Ste 1 San Diego, CA 92136-5294	Ms. Adrianne Saboya (619) 524-6949	Quality Assurance Manager

1.5 SPECIAL TRAINING AND CERTIFICATION

Personnel who work at a hazardous-waste site are required to meet the health and safety training requirements of Title 29 Code of Federal Regulations (29 CFR) Part 1910.120(e). The following sections summarize the training requirements for PWCSD personnel and subcontractors.

1.5.1 Personnel Health and Safety Training

PWCSD personnel working on hazardous-waste project sites who are responsible for project or site activities are required to have specific training before participating in, managing, or supervising field activities. The training has covered the following areas:

- Names of personnel and alternates responsible for health and safety at a hazardous-waste project site.
- Health, safety, and hazards present on site.
- Selection of the appropriate personal levels of protection
- Correct use of personal protective equipment (PPE).
- Work practices to minimize risks from hazards.
- Safe use of engineering controls and equipment on site.
- Medical surveillance requirements, including recognition of symptoms and signs that might indicate overexposure to hazardous substances.
- Contents of the site safety plan (SSP)

PWCSD personnel engaged in activities that expose or could expose workers to hazardous substances and health hazards at a hazardous-waste site will receive a minimum of 40 hours of formal instruction off site and a minimum of 3 days of actual field experience on site under the supervision of a trained, experienced field supervisor.

Field personnel directly responsible for, or who supervise employees engaged in, hazardous-waste operations also will receive the 40 hours of initial training, 3 days of supervised on-site field experience under a trained supervisor, and at least 8 additional hours of specialized supervisor training. The specialized training will include the requirements of the health and safety program, training requirements, the PPE and personal level of protection programs, and health-hazard monitoring procedures and techniques.

Written certificates will be presented to employees who successfully complete this training. PWCSD employees engaged in work at hazardous waste sites also are required to undergo 8 hours of annual refresher training to maintain certificates.

The PWCSD field team leader, who is the on-site manger with authority delegated by the project manager to direct field operations, will be fully trained in potentially hazardous-waste and will ensure that necessary preparation and coordination are complete before on-site work begins.

This preparation generally consists of drafting project documents, such as the Work Plan, and assisting in preparation of the site-specific under guidance of the project manager.

The PWCSD field team will maintain current certification for first aid and Cardiopulmonary resuscitation (CPR). The Health and Safety Manager (HSM) is responsible for providing on-site CPR as necessary. In the event the HSM is not on the site, another qualified team member will perform the necessary aid. The HSM ensures that appropriate field personnel maintain current certification in both first aid and CPR.

Copies of PWCSD health and safety training records, including course completion certifications for the initial health and safety training, first aid, CPR and refresher training, will be maintained by the HSM. The HSM implements the training requirements by notifying employees when they are due for recertification, disseminating information about courses, conducting or assisting in refresher training, and carrying out other such tasks.

1.5.2 Subcontractor Training

Subcontractors who work on site will certify that their own employees have been trained for work on hazardous waste project sites. Training will meet the Occupational Safety and Health Administration (OSHA) training requirements of 29 CFR 1910.120(e). Before beginning work at the project site, the subcontractors will submit to the HSM certification of training for each employee who will be involved in fieldwork. The subcontractors will also ensure that these employees attend a pre-entry safety briefing.

The pre-entry safety briefing is designed to inform subcontractor employees of the potential risks of working with hazardous materials, site-specific hazards, the required level of personal protection, and the use of PPE. This safety briefing is conducted by the on-site health and safety coordinator or another qualified person designated by the HSM. All employees of professional services firms and technical services subcontractors will attend a safety briefing and complete a safety meeting sign-off sheet before conducting work on the site. Construction service contractors are responsible for conducting their own safety briefings.

1.5.3 Professional Registration

Registration to practice geology in the State of California is required by the Geologists and Geophysicist Act, California Board of Geologists and Geophysicists. Registration is required to ensure the public that those individuals licensed and certified have met defined levels of education and experience. All work performed for the project will be overseen and reviewed by a registered professional.

2.0 BACKGROUND

UST Site 41319 previously contained a UST used to store waste oil from vehicle maintenance operations. The site is located on the north side of El Camino Real approximately 350 feet west of Fisher Road in the 41 Area. The 2,000-gallon waste oil tank, UST 41319, was removed in 1994. Site location and background, including a site description and previous investigation findings, are presented in Section 2.0 of the RAWP.

3.0 MAPS

The following figures are excerpted from the RAWP for reference. UST Site 41319 is located in the 41 Area of MCB Camp Pendleton (Figure 1-1). The Site is shown with nearby Area 41 buildings in Figure 1-2. Soil quality data from previous investigations is summarized on Figure 3-1.

4.0 SAMPLING PROCESS DESIGN

This section describes the collection and analysis of soil samples to meet the project objectives during field activities. Figure 3-1 identifies the proposed area to be excavated. An estimated 275 cubic yards of soil will be excavated to achieve the proposed remedial action cleanup goals. This volume estimate is based on a proposed average excavation area of 80 feet by 40 feet in area to variable depths. A mobile laboratory certified in the State of California will be used to allow rapid confirmation of remedial objectives.

4.1 SAMPLING METHODS

4.1.1 SOIL CONFIRMATION SAMPLING

The excavation will focus on areas exceeding proposed cleanup goals based on existing data, and will proceed until proposed cleanup goals are obtained. A mobile laboratory will be used to perform on-site analysis for assessing cleanup goal attainment. Ten percent of the analyses performed by the mobile laboratory will be confirmed by a fixed-based laboratory. Final excavation limits may be constrained by operational features such as the existing oil/water separator and retaining wall.

At a minimum, one confirmation soil sample will be collected for every 20 linear feet of each sidewall, and one sample will be collected from the excavation bottom. The number of samples will be based on the final size of the excavation and the *San Diego County Site Assessment and Mitigation* (SAM) *Manual 2004* requirements (DEH, 2004). Groundwater underlying UST Site 41319 will not be sampled during the soil excavation activities.

4.1.1.1 Mobile Laboratory Analysis

An on-site mobile laboratory will be used to analyze confirmation soil samples for TRPH, TPH-d, and TPH-g. Each sample will be prepared and analyzed for TRPH, TPH-g and TPH-d. Because metals are typically less mobile than petroleum, TRPH, TPH-d, and TPH-g values will be used as surrogates for Title 22 metals, which may have impacted soil in the waste oil release. It should be noted that previously reported concentrations of metals in soil are less than MCB Camp Pendleton background values or residential PRGs.

4.1.1.2 Fixed Laboratory Analysis of Verification Samples

Verification samples for submittal to a fixed laboratory will be collected at a rate of ten percent of total mobile laboratory samples. Verification samples will be analyzed for TRPH, TPH-d, and TPH-g. Results will be used to verify mobile laboratory results, in accordance with SWDIV protocol.

4.1.2 WASTE CHARACTERIZATION SAMPLING

Waste generated during site activities will consist of decontamination water and excavated soils. Decontamination wastewater will be stored on site in 55-gallon drums, and excavated soil will be stored temporarily in stockpiles. Drums will be labeled and placed in a secure area. Stockpile samples will be analyzed for TRPH, TPH-g, and TPH-d. Additional analyses will not be performed on the waste for characterization, unless required by the disposal facility.

4.2 SAMPLE HANDLING AND CUSTODY

4.3 SAMPLE NUMBER

To provide a method of tracking each sample through collection, analysis, data review, and data reduction, a sample identification system has been established for sampling activities at the site. Sample number identification will be assigned in the field according to the following convention:

USTSITEID two to five-character UST Site ID

YYYY Four character designation of the consecutive sample numbers (with leading zeros used where necessary)

For example, in the sample identification number 41319-001, "41319" refers to UST Site 41319, and "001" represents the first sample collected for this investigation. This sampling scheme will ensure that field quality control samples are submitted "blind" to the laboratory.

Cross-reference information regarding the sampling locations and the assigned sample identification number including field quality control samples will be documented in the Sample Identification and Analysis Form. The forms are maintained in a project-specific bound logbook.

4.4 SAMPLE LABELING

Sample labels are necessary to prevent misidentification of samples. Sample labels will be filled out in indelible black ink and affixed to sample containers at the time of sample collection. Each sample container will be labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock)
- Sampler's initials
- Analyses required
- Preservative (if any)

4.5 SAMPLE PACKAGING AND SHIPMENT

Upon sample labeling, sample custody documentation will be completed, and sample custody will be immediately transferred to the mobile laboratory for on-site analysis.

4.6 FIELD DOCUMENTATION

To maintain the integrity and traceability of samples, all information pertinent to field sampling will be recorded in a field logbook. All samples will be properly labeled prior to being delivered to the mobile laboratory and will be accompanied by completed COC documentation. All documentation will be recorded in a field logbook in black indelible ink.

4.6.1 Chain-of-Custody

To establish the documentation necessary to trace sample possession from the time of collection through analysis and disposal, a COC record will be completely filled out and will accompany every sample. Samples will be delivered to the laboratory for analysis as soon as practicable. A COC record will accompany all samples.

At a minimum, the following items will be recorded on the COC form:

- Project name
- Project location
- Project number (PWCSD)
- Sample ID
- Sampler name
- Sampler signature
- Project contact
- Date (of sample collection)
- Time (of sample collection to the nearest minute, 24-hour clock)
- Sample type (matrix)
- Turnaround time
- Sample depth in feet (start, end)
    - Composite description (if applicable)
    - Laboratory name
- Number of sample containers
- Laboratory ID
- Analyses required

- Comments
  - Matrix spike/matrix spike duplicate (MS/MSD) samples
  - Observations specific to sample
  - Electronic data format (EDF) required
- Transfer signature (to relinquish samples)
  - The sampler will be the first person to relinquish sample possession
- Courier/laboratory representative signature (for commercial carrier, record airbill number here)
- Date/time (of custody transfer)
- Laboratory instructions
  - Data package requirement

4.6.2 Custody Seals

Sample custody seals are used to detect unauthorized tampering of samples from the time of sample collection to the time of analysis. The seals will be signed or initialed and dated by the sampler. The seals will be placed on the shipping containers in such a way that they must be broken in order to open the coolers. Seals will be affixed to coolers before the samples leave the custody of the sampling personnel.

4.6.3 Field Logbooks

A permanently bound field logbook with consecutively numbered pages, used for sampling activities only, will be assigned to this project. All entries will be recorded in indelible black ink. At the end of each workday, the logbook pages will be signed by the responsible sampler and any unused portions of the logbook pages will be crossed out, signed, and dated.

If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used, and the person receiving the logbook will sign and date the next page to be used.

At a minimum, the logbook will contain the following information:

- Project name and location
- Date and time
- Personnel in attendance
- General weather information
- Work performed

- Field observations
- Sampling performed, including specifics such as location, type of sample, type of analyses, and sample identification
- Field analyses performed, including results, instrument checks, problems, and calibration records for field instruments
- Descriptions of deviations from this SAP
- Problems encountered and corrective action taken
- Identification of field QC samples
- QC activities
- Verbal or written instructions
    - Any other events that may affect the samples

4.6.4 Document Corrections

Changes or corrections on any project documentation will be made by crossing out the erroneous item with a single line and initialing (by the person performing the correction) and dating the correction. The original item, although erroneous, must remain legible beneath the cross-out line. The new information should be written clearly above the crossed-out item.

5.0 REQUEST FOR ANALYSIS

This section describes the analytical methods, sample containers, and container preservation requirements. Additionally, field quality control (QC) samples to be collected for this project will be discussed in this section.

5.1 ANALYTICAL METHODS

The following Environmental Protection Agency (EPA) analytical methods [*Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846,* Third Edition and final updates (EPA, 1986)] will be used to analyze soil samples during this project.

- TRPH by EPA Method 418.1 for confirmation soil samples and stockpile soil samples,
- TPH-d and TPH-g by EPA Method 8015M for confirmation soil samples and stockpile soil samples, and
- TPH-d, TPH-g and TRPH by EPA Methods 8015M and 418.1 respectively for equipment rinsate samples, if necessary.

Detailed information on methods, calibration criteria, project-required reporting limits, and QC acceptance criteria are presented in Section 9.0.

5.2 SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

Table A.5-1 lists the sample containers, preservatives, and holding time requirements for samples.

5.3 FIELD QUALITY CONTROL SAMPLES

Field QC samples are typically collected and analyzed during the project to assess the consistency and performance of the sampling program. Field QC samples include field duplicates and equipment rinsates. Field duplicate samples will be collected for confirmation soil samples at a frequency of one per every ten samples, and will be analyzed for TPH-g, TPH-d, and TRPH. Equipment blank samples will not be collected because disposable sample containers will be used, which require no use of intermediate sampling devices. Field QC samples will not be collected for waste and stockpile characterization samples.

6.0 FIELD METHODS AND SAMPLING PROCEDURES

The following sections present sampling procedures and sample handling procedures to be used for this project.

6.1 CONFIRMATION SOIL SAMPLING PROCEDURES

Confirmation soil samples from the excavation sidewalls and base will be collected using new factory-cleaned glass sample jars. The following steps summarize the sampling procedures to be performed.

- Sampling personnel will don a new pair of disposable nitrile gloves immediately before collecting soil samples at each location.
- Much of the excavation will likely allow personnel access to the sides and base of the excavation for sampling. Where the excavation is too deep for safe access, the excavator bucket will be used to obtain soil samples from the bottom and sides of the excavation. Soil samples collected from the excavator bucket will be taken from the target sample material not in direct contact with the excavator bucket.
- Samples will be collected using appropriate containers listed in Table A.5-1. Sample jars will be immediately labeled and delivered to the mobile laboratory for immediate analysis so as not to compromise analyses. Samples submitted for TPH-g analysis will be collected in accordance with U.S. EPA Method 5035. Each confirmation soil sample will be analyzed for TPH-g, TPH-d, and TRPH. Fixed laboratory verification samples will be processed in accordance with procedures identified in Section 4.2.

6.2 WASTE CHARACTERIZATION SAMPLING

Excavated soils and decontamination water may be generated during field activities. The analytical results from the stockpiled soils and decontamination water will be used for waste profiling. Additional analyses will not be performed for waste characterization, unless required by the disposal facility.

6.2.1 Soil Stockpile Sampling

Soil stockpile samples will be collected as follows:

- The volume (in cubic yards) of the stockpiles will be calculated using the following formulas:

$$V = A * H/27$$

Where: V = volume in cubic yards
A = Area of the base of the stockpile in square feet calculated using one of the following formulas:
Rectangular = length * width
Square = length * width

Triangular = ½ base * height
Circular = 3.14 * radius * radius
Oval = 3.14 * long radius * short radius
H = average height of the stockpile in feet
27 = conversion factor for cubic feet to cubic yards

- The number of samples required will be based on guidelines in accordance with the SAM Manual 2004 (DEH, 2004) or as required by the disposal facility.

- Stockpile samples will be collected in a pre-cleaned, wide-mouth glass jar or brass/stainless steel liner.
- Sample containers will be labeled and clear packing tape will be placed over the label to secure it.
- A signed custody seal will be placed over the cap(s) of the container.
- The container will be delivered to the on-site mobile lab for immediate analysis.
  - The sample number, date, time, and description of the sample will be recorded on the COC form and in the field logbook. All entries will be written in indelible black ink.
  - All nondisposable sampling equipment will be decontaminated prior to each use as described in Section 6.4 of this SAP.

6.3 DECONTAMINATION PROCEDURES

Decontamination of nondisposable sampling equipment will be performed to prevent the introduction of extraneous material into samples and to prevent cross-contamination between samples. All sampling equipment will be decontaminated by steam cleaning or by washing with a nonphosphate detergent, such as Liquinox™, or equivalent. Decontamination water will be collected in 55-gallon drums.

The following steps will be followed for decontamination of the nondisposable sample equipment:

1. **Wash with nonphosphate detergent and water solution**—This step will remove all visible contamination from the equipment. A suitable-sized bucket filled with cleaning solution and a long-handled brush is suggested for this step. Dilute nonphosphate detergent as directed by the manufacturer.
2. **Rinse with potable water**—This step will rinse all the detergent solution away from equipment. A suitable-sized bucket filled with water and a long-handled brush is suggested for this step. Periodic changing of this water is required. Perform this rinse twice.
3. **Rinse with deionized/laboratory reagent-grade water**—This step will include double rinsing to remove any detergent solution and potable water residues. Rinsing is most effective when water is applied using a stainless steel Hudson-type sprayer or Nalgene® squeeze bottle while holding equipment over a suitable-sized bucket.

If equipment rinsate samples are to be collected, water from the final rinse that is falling off the sampling equipment (split-spoon sampler, bailer, and so forth) will be collected in appropriate sample bottles and analyzed for the same parameters as the field samples.

7.0 QUALITY ASSURANCE OBJECTIVES

The overall quality assurance (QA) objectives of this SAP are to outline procedures for the collection and assessment of data that are within acceptable ranges of precision, accuracy, representativeness, completeness, and comparability (PARCC).

7.1 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT

The data quality objective (DQO) process is a seven-step planning approach based on scientific methods that are designed to ensure that the type, quantity, and quality of environmental data used for decision making are appropriate for the intended application. The DQO process, as defined by the EPA, consists of seven steps that are designed to provide a systematic approach to resolving issues that pertain to this remediation project (EPA, 2000). For UST Site 41319, the following DQOs have been established:

Step 1 Problem Statement

Residual petroleum-based contamination related to former waste oil tank remains at UST Site 41319.

Step 2 Decision Questions

What is the area of soil at UST Site 41319 which exceeds cleanup goals and would ultimately require removal?

Step 3 Input to Decisions

- Existing laboratory data from previous investigations
- Confirmation samples analyzed by on-site mobile laboratory and fixed laboratory verification sample results, and
- Proposed cleanup goals.

Step 4 Study Boundaries

Vertical and lateral boundaries for soil excavation will be determined based on existing laboratory data from previous investigations and confirmation samples analyzed by on-site mobile laboratory during this investigation. The temporal boundary of the investigation is FY04. Temporal boundaries will be defined by sample results representing concentrations of constituents at the time of the investigation.

Step 5 Decision Rules

If soil concentrations exceed cleanup goals specified in Section 1.2, **then** soil removal area will be expanded vertically and/or horizontally.

If soil concentrations are less than cleanup goals specified in Section 1.2, **then** the extent of the excavation will be determined to be adequate.

Step 6 Specifying Limits on the Decision Error.

Measurement error will be managed by using standard laboratory methods and field SOPs. Decision uncertainty will be limited by the used of judgmental sampling in consideration of previous sampling results.

Step 7 Optimizing Sampling Design.

Sampling will be optimized by augmenting existing soil quality data with confirmation soil samples collected in accordance with DEH protocols.

7.2 ANALYTICAL DATA QUALITY OBJECTIVES

Analytical data will be obtained using published, standard methods in a state of California Department of Health Services (DHS)-certified laboratory. Analytical DQOs will be assessed through measures of PARCC parameters. The analytical methods used, project-required reporting limits (RLs), and project QC criteria are presented in Table A-7-1 and detailed in the following sections.

7.2.1 Quality Control Criteria

QC criteria definitions are as follows:

- **Precision**—A measure of the reproducibility of a set of replicate results or the agreement among repeat observations made under the same conditions. Analytical precision is the measurement of the variability associated with duplicate or replicate analyses. For this project, a laboratory control sample (LCS) will be used to determine the precision of the analytical method. Total precision is the measurement of the variability associated with the entire sampling and analysis process. It is determined by analysis of duplicate field samples and measures variability introduced by both the laboratory and field operations. Field duplicate, laboratory duplicate, and MSD samples will be used to assess field and analytical precision, and the precision measurement will be determined using the relative percent difference (RPD) between the duplicate sample results. The formula for calculating the RPD is as follows:

  $$RPD = 100 \times 2 \times (\text{result} - \text{duplicate result})/(\text{result} + \text{duplicate result})$$

- **Accuracy**—The nearness of a result or the mean of a set of results to the true or accepted value. Analytical accuracy is measured by comparing the percent recovery of analytes spiked into a LCS against a control limit. Surrogate compound recoveries are also used to

assess accuracy and method performance for each sample analyzed. The formula for calculating accuracy uses the following equation to determine percent recovery (%R) of specific analytes.

%R = 100 x (spiked sample result - unspiked sample result)/amount of spike added

- **Representativeness**—The degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter mostly concerned with the proper design of the sampling program.
- **Completeness**—The percentage of measurements made that are judged to be valid measurements. The completeness goal is to generate a sufficient amount of valid data to meet project needs. Completeness is calculated and reported for each method, matrix, and analyte combination. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. For completeness requirements, valid results are all results not qualified with a rejected ("R") flag. The requirement of completeness is 90 percent for soil samples and is determined using the following equation:

% completeness = 100 x (number of valid analyte results/number of possible results)

- **Comparability**—A qualitative parameter expressing the confidence with which one data set can be compared with another. Sample data should be comparable with other measurements for similar samples and sample conditions. The objective for the QA/QC program is to produce data with the greatest possible degree of Comparability. The number of matrices that are sampled and the range of field conditions encountered are considered in determining comparability. Comparability is achieved by using standard methods for sampling and analysis, reporting data in standard units, normalizing results to standard conditions, and using standard and comprehensive reporting formats.

8.0 ANALYTICAL QUALITY CONTROL PROCEDURES

This section describes laboratory qualification, sample custody and documentation, QC procedures, laboratory QC samples, preventative maintenance, data review, and deliverables.

8.1 LABORATORY QUALIFICATION

Both analytical laboratories (mobile and fixed-based) selected to analyze samples for this project will be certified by the California DHS through the Environmental Laboratory Accreditation Program for all of the analytical methods required for the project.

8.2 LABORATORY SAMPLE CUSTODY AND DOCUMENTATION

The integrity and traceability of samples from the time they are collected through the time data are reported are essential in any sampling and analysis program. The handling of the samples and transferring of custody must be well documented given the evidentiary nature of the analytical data. A sample is considered to be in one's custody if it meets any of the following criteria:

1. In actual possession or in view of the person who collected the sample
2. Locked in a secure area
3. Placed in an area restricted to authorized personnel

PWCSD field staff will deliver samples to the on-site mobile laboratory and the fixed-base laboratory, transferring sample custody at the time of sample submittal. Upon receipt of a sample, the laboratory operator will inspect the condition of the sample, reconcile the information on the sample label against that on the COC record, assign a unique laboratory tracking number, log the sample in the laboratory logbook and process the sample immediately.

Field personnel will immediately reconcile any inconsistencies between the COC form and the sample containers received. Any deviations from accepted sample handling procedures will be documented, and the PWCSD Quality Assurance Manager will be informed.

Changes or corrections on any project documentation will be made by crossing out the erroneous item with a single line initialing (by the person performing the correction) and dating the correction. The original item, although erroneous, must remain legible beneath the cross-out line. The new information will be written above the crossed-out item. Corrections must be written clearly and legibly with indelible black ink.

8.3 LABORATORY QUALITY CONTROL PROCEDURES

The analytical laboratory must have written standard operating procedures (SOPs) defining the instrumentation, instrumentation maintenance, tuning, calibration, method detection and RLs, QC requirements, blank requirements, and step-by-step procedures for each analytical method. The SOPs must be available to the analysts performing the work. The SOPs must meet or exceed the requirements of the analytical methods cited in this SAP.

8.4 LABORATORY QUALITY CONTROL SAMPLES

The following subsections describe in detail the laboratory QC protocols and samples required by this project.

8.4.1 Calibration

All instruments and equipment must be calibrated in accordance with the specified methods unless different instructions are included in this document. Each instrument must be calibrated with the standard solutions appropriate to the type of instrument and the calibration range established for the method.

Initial calibrations are performed when the method is first used and again whenever the continuing calibrations fail to meet their respective acceptance criteria. In addition, if the instrument undergoes significant maintenance, the initial calibration must be repeated.

Continuing calibrations verify that the instrument performance has remained within the limits set at the time of the initial calibration. The frequency of continuing calibrations is specified in referenced methods.

8.4.2 Instrument/Calibration Blanks

Instrument blanks are run to ensure that analytes from previous runs are out of the system and do not contaminate succeeding runs. Instrument blanks must be run following calibration runs, before sample analyses are performed, and after samples containing high concentrations of potentially interfering materials are found.

Target analytes must not appear in the instrument blanks at concentrations greater than half the required RLs. If the laboratory consistently observes contaminants in the instrument blanks, the laboratory must investigate the source of the contamination and eliminate it, if possible.

8.4.3 Method Blanks

Method blanks are prepared in the same manner as the samples, using the same reagents and glassware used for samples. The purpose of the method blank is to ensure that the equipment

and reagents used in preparing the samples are free of contaminants that could interfere with the analysis. The method blank must be prepared and analyzed for each batch of 20 project samples or less per matrix (aqueous and solid) type.

The method blank must not exhibit analytes at concentrations greater than half the required RLs. If contaminants are found that either contribute to the apparent concentration of a particular target analyte or interfere with the analysis, the analysis must be stopped, the source of contamination identified and corrected, and the analysis repeated. Contamination in the method blank above half the RLs will require that the entire associated batch of extracts or digestates be reprepared and reanalyzed. Hence, it is very important to make sure that no such contamination is present.

8.4.4 Laboratory Control Samples

LCSs are prepared by spiking known amounts of target analytes into a well-characterized blank matrix. The matrix will be organic-free, laboratory reagent-grade water for water samples and clean sand or equivalent for soil samples.

The LCS is prepared and run at a frequency of one per 20 project samples per matrix with the associated samples, using the same reagents and volumes. If an insufficient quantity of a sample is available for MS/MSD, a LCS will be prepared and analyzed in duplicates. All analytes in the LCS must meet recovery criteria.

8.4.5 Matrix Spike and Matrix Spike Duplicate

The MS/MSD serves to determine whether matrix effects are affecting recoveries. A MS/MSD is prepared by spiking a known amount of solution to two portions of a sample being run in a batch. Once the spike is added to the MS/MSD samples, these samples are carried through the complete sample preparation process along with the other samples in the batch. The MS/MSD recoveries are compared against each other and against the known amount of the spike. From this data, both matrix-specific accuracy and precision can be determined. To prepare a project-specific MS/MSD, field personnel will collect additional sample volumes at a frequency of one per 20 soil samples. Field personnel will designate samples for MS/MSD analysis on the COC form.

8.4.6 Duplicates

Two types of duplicates, field and laboratory, will be performed. Field duplicates are two samples that are duplicates of each other. Field duplicates for soil samples may be collected. The purpose of field duplicates is to measure the consistency of field sampling. The field duplicate is

treated the same as the other field samples and identification is withheld from the laboratory. Field duplicates will not be applicable to the collection of waste characterization samples.

The laboratory duplicate is created by the laboratory, where two aliquots are intentionally taken from the same sample and analyzed in parallel. This analysis serves to measure the precision of laboratory operations. Duplicate analyses will be conducted for TPH-g, TPH-d, and TRPH.

8.5 PREVENTIVE MAINTENANCE

All instruments must be maintained in accordance with the manufacturers' recommended procedures. The laboratory must define in its QA plan the frequency and type of maintenance for each instrument. The laboratory must also record all maintenance activities in an instrument logbook.

In addition to preventive maintenance, the laboratory must keep a sufficient supply of replacement parts on hand for those parts known to require frequent changes due to wear and tear or contamination.

Whenever preventive or corrective maintenance is applied to an instrument, the laboratory must demonstrate the instrument's return to operating conditions and must recalibrate the instrument prior to resumption of sample analyses.

8.6 DATA REVIEW

All data reported by the laboratory must be reviewed in accordance with the SOPs and as described in the following subsections.

8.6.1 Analyst Review

Each analyst that generates a data set is responsible for ensuring that 100 percent of the data comply with the method and project-specific requirements and that any deviations or failure to meet criteria are documented for the project file.

8.6.2 Peer Review

One hundred percent of all data sets must be reviewed by an independent peer analyst. Peer reviews must be performed by an analyst that is qualified to perform the subject analytical method. The peer review must be comprehensive and include the following:

- Check 100 percent of manual entries for transcription errors
- Check 100 percent of manual calculations for accuracy
- Spot-check computer calculations to verify program validity

- Check for compliance with method- and project-specific QC requirements
- Check for completeness of raw data or supporting materials
- Confirm spectral assignments
- Check descriptions of deviations from method or project requirements
- Check for appropriate use of significant figures and rounding
- Check reported values for dilutions
- Evaluate reasonableness of results

8.6.3 Technical Reviews

Technical reviews by the responsible supervisor or designated alternate must be performed on 100 percent of reported data. The same individual may not perform peer and technical reviews on the same data set. The technical review must include the following:

- Check for compliance with method- and project-specific requirements
- Check the completeness of the reported information
- Check the information in the report narrative
- Evaluate the reasonableness of the results

If the responsible supervisor is the only qualified peer reviewer for a method, the requirement for the technical review is waived.

8.6.4 Management Review

One hundred percent of all data must receive management approval prior to release. The scope and content of management's review is at the laboratory's discretion. Authority to release data may be delegated to a technical supervisor or other party, if the term of the delegated authority is documented in the QA program file.

8.6.5 Quality Assurance Review

QA reviews of data from each section of the laboratory must be conducted on a routine basis. At least 10 percent of data reports generated using each analytical method must be reviewed by a member of the QA staff. The QA reviews must include the following:

- Check for compliance with required QC practices
- Check for compliance with approved SOPs
- Check for compliance with method and project requirements

QA data reviews may be conducted after the subject data have been reported to PWCSD.

8.7 EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

8.7.1 Field Equipment

If necessary, air will be monitored for the presence of VOCs using a Toxic Vapor Analyzer (TVA). The TVA has both a photoionization detector and a flame ionization detector. Before any test equipment is used in the field, it must be inspected and calibrated (if appropriate) at the beginning of day to confirm that the equipment is operational and functioning properly.

The analyzers and meters will be inspected at the beginning of each day of field activities to confirm that the equipment is operational and functioning properly. Maintenance of the analyzers and meters shall comply with the recommended maintenance procedures given in the manufacturer's operation and maintenance manuals.

8.7.2 Laboratory Equipment

Tuning, initial calibration, and continuing calibration for laboratory instruments will be completed in accordance with EPA SW-846 protocol. All other laboratory equipment functions will be followed as outlined in each laboratory SOP.

8.8 INSPECTION AND ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Whenever possible, all supplies (such as sample containers and calibration solutions) used for the project will be new and in original containers. PWCSD field staff will inspect all supplies prior to use to confirm that contamination or other issues do not exist that would cause problems with the environmental data. If appropriate, the lot numbers for supplies will be recorded in the field logbook.

8.9 NON-DIRECT MEASUREMENTS

No extensive information from computer databases, literature files, or historical databases will be used for the project.

8.10 DELIVERABLES

The following sections describe the deliverable documents that will be submitted to PWCSD by the analytical laboratory.

8.10.1 Hard-Copy Deliverables

One set of hard-copy data reports will be submitted to PWCSD by the mobile laboratory. The mobile laboratory will submit a standard data package, which includes analytical results, QC summaries, and chromatograms. Data generated from the fixed-base laboratory will consist of Level IV data packages to include raw data so data can be validated. Refer to Section 9.2 for data validation requirements.

8.10.2 Electronic Deliverables

The laboratory will submit data in the State Water Resources Control Board (SWRCB) UST program "EDF." The laboratory will check all EDFs using the Electronic Data Consistency Checker (EDCC) software which generates a report summarizing any errors/warnings found in the EDF. The report must be submitted to PWCSD along with the EDF, and must indicate zero error in order for the EDF to be acceptable. "Warnings" may be acceptable in the report, but must be discussed in the EDCC documentation. If PWCSD finds that errors exist in the EDF, the laboratory must correct the errors and resubmit the EDF. A complete EDF submission includes a diskette containing the EDF files and a hard-copy EDCC report showing zero errors.

9.0 DATA QUALITY MANAGEMENT

9.1 DATA MANAGEMENT

The following sections describe the requirements for the management of hard-copy data and electronic data.

9.1.1 Hard-Copy Report

All laboratory data and documentation, including, but not limited to, logbooks, data sheets, electronic files, and final reports, will be maintained by the laboratory for at least 7 years. PWCSD will be notified 30 days before disposal of any relevant laboratory records. PWCSD will maintain copies of all COC forms. Laboratory reports will be logged in upon receipt and filed in chronological order.

9.1.2 Electronic Data

Field information (date and time collected, sample identification, and so forth) will be entered directly into the main database from the COC form or uploaded from electronic files generated in the field. Upon receipt by the PWCSD Data Manager, electronic data will be uploaded in compliance with State Geotracker requirements.

9.2 DATA VERIFICATION AND VALIDATION

9.2.1 Field and Laboratory Data Verification

Project personnel will verify field data collected during this investigation by reviewing for accuracy, precision, and completeness. Any errors or inconsistencies will be resolved immediately by clarifying the issue with the appropriate field personnel. All field personnel will be responsible for following the sampling and documentation procedures described in this FSP/QAPP. Discrepancies resulted from the review of existing data will be addressed as a factor in the uncertainty associated with the decision-making process.

Laboratory data generated during this investigation will be subject to two levels of review within the laboratory. A chemistry supervisory-level review will be completed to verify analyte identification, quantitation, and QC data. Evidence of that review will be maintained in the form of a checklist outlining method and project requirements. The Laboratory Project Manager will work with the Laboratory QA/QC Manager to review all results, investigate QC outliers and anomalies and potential noncompliance with project requirements.

If needed, the data should be able to serve as a legal record of the field activities conducted. In order to serve these purposes, all of the following verification criteria must be met:

- Date and time of sample collection - required to uniquely identify sample and assess holding time limitations.
- Location of samples, including depth, if appropriate - required to uniquely identify samples (these data will be provided in the field logbook).
- Chain-of Custody documentation - required to demonstrate integrity of samples and maintain unique identity of samples. It includes a unique sample identification number, sample collection date and time, and signature of the persons relinquishing and receiving the sample.
- Field QA/QC procedures - required to demonstrate sample integrity; it includes field decontamination procedures to prevent cross-contamination, the collection of field blanks, and the collection of duplicate samples during each sampling activity.
- Name and location of laboratory - required for chain-of custody documentation and to verify credentials of laboratory.
- Analytical methods - required to assess appropriateness and acceptability of analytical method used.
- Detection limits - required to assess the lower limit of parameter identification.
- Holding times, and dates of extraction, analysis and preservation - required to assess whether the samples were extracted and analyzed within the holding time required.
- Laboratory QA/QC procedures - required to assess analytical accuracy and sample integrity. Spikes, duplicates, method blanks, and surrogates for each analytical batch are to be analyzed by the laboratory at appropriate frequencies.

Incomplete information and discrepancies associated with historical data will be addressed as a factor in the uncertainty associated with the decision-making process.

9.2.2 Data Validation

Following data verification, data validation for data collected during this investigation will be performed in accordance with SWDIV Environmental Work Instruction EWI#1 (SWDIV, 2001). Following the SWDIV policy, an independent party with experience performing data validation for Navy projects will perform the validation. With the exception of waste characterization samples, data will be validated at 90 percent EPA Level III and 10 percent EPA Level IV. Data validation will be performed in accordance with the EPA Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (USEPA, 1999b) and QC criteria specified in this document.

Validation of data generated from previous investigations will generally conform to Level III guidelines except that evaluation of QC sample results will be limited to the information provided in the available laboratory reports.

For level III data validation, the data values for routine and QC samples are generally assumed to be correctly reported by the laboratory. Data quality will be assessed by comparing the QC parameters to the appropriate criteria (or limits) as specified in method requirements (e.g., CLP, SW-846) and this SAP. If calculations for quantitation are verified, it is done on a limited basis and may require raw data in addition to the standard data forms.

Level IV or full data validation follows the EPA protocols and CLP criteria as set forth in the functional guidelines for evaluating organic analyses (EPA 1999). These guidelines apply to full validation data packages that include the raw data (e.g., spectra and chromatograms) and backup documentation for calibration standards, analysis run logs, LCS, dilution factors, and other types of information. This additional information is utilized in the full data validation process for checking calculations for quantified analytical data. Calculations are checked for QC samples (e.g., MS/MSD and LCS data) and routine field samples (including field duplicates, field and equipment rinsate blanks, and VOC trip blanks). To assure that detection limit and data values are appropriate, and evaluation is made of instrument performance, method of calibration, and the original data for calibration standards.

Analytical data may be qualified based on data validation reviews. Qualifiers will be consistent with the applicable EPA functional guidelines and will be used to provide data users with an estimate of the level of uncertainty associated with the result "flagged".

9.3 RECONCILIATION WITH USER REQUIREMENTS

The objective of this section is to evaluate the results of the task against the DQOs and requirements of the data users or decision makers.

Analytical results will be evaluated through the validation and verification steps discussed previously in this SAP and through the use of PARCC parameters. Limitations on the use of the data will be addressed as a factor in the uncertainty associated with decision-making process.

10.0 QUALITY ASSURANCE OVERSIGHT

QA oversight for this project may include an audit of field activities, including an evaluation of mobile laboratory performance.

10.1 ASSESSMENT AND RESPONSE ACTIONS

Oversight of environmental data collection will be completed using three types of audits, described below. Any problems encountered during the field investigation will require appropriate corrective action procedures to ensure that the problems are resolved. This section described the types of audits that may be completed, corrective action procedures that will be taken in the event of problems in the field or laboratory, and quality assurance reports to management.

10.1.1 Performance, System and Field Audits

An audit evaluates the capability and performance of a measurements system or its components and identifies problems that warrant correction. Three types of audits may be conducted during fieldwork for this project: performance, system, and field. The QA program manager, project QA officers, or senior technical staff will complete and schedule audits. Auditors will be independent of the activities audited and will be selected by the project QA officer. Technical expertise and experience in auditing will be considered in selecting an auditor or audit team.

The auditor or audit team will develop an individual plan to provide a basis for each audit. Audits may include reviews of project plan adherence, training status, health and safety procedures, activity performance and records, budget status, QC data, calibrations, and conformance to SOPs. Audits may also review compliance with laws, regulations, policies, and procedures. After an audit is completed, the auditor will submit the audit report to the project file. The project QA officer will coordinate a management review of any deficiencies that are noted.

The auditor or audit team can issue a corrective-action request form to identify and schedule specific corrective actions to be undertaken and completed by the project managers. The auditor verifies that the corrective action has been completed.

10.1.1.1 Performance Audits

The laboratory must be certified by the state of California through the Department of Health's Environmental Laboratory Accreditation Program (ELAP). In addition, the

laboratory must successfully complete the Naval Facilities Engineering Service Center (NFESC) laboratory evaluation process prior to receiving any samples from the project for analysis. The laboratory evaluation will be based on the latest version of the IRCDQM.

A performance audit is a review of the existing project and QC data to evaluate the accuracy of a total measurement system or a component of the system. The Navy may conduct laboratory performance audits before samples are submitted to the laboratory for analysis.

10.1.1.2 System Audits

A system audit is used to verify adherence to QA policies and SOPs. This type of audit may consist of on-site review of measurement systems. In addition, procedures for measurement, QC, and documentation may be evaluated. The first system audit is conducted shortly after a system becomes operational and on a regularly scheduled basis thereafter.

10.1.1.3 Field Audits

A field audit involves an on-site visit by the auditor or audit team. Items to be examined include the availability and implementation of approved field procedures, calibration and operation of equipment, chain-of-custody procedures and instructions, and nonconformance documentation. The Navy QA officer may also conduct a field audit of this project. Items reviewed by the Navy QA officer during the field audit would be similar to those described above.

10.1.2 Corrective Action Procedures

An effective QA program requires prompt correction of non-conformance conditions that affect quality. Rapid and effective correction action minimizes the possibility that questionable data or documentation will be produced. Two types of corrective actions exist. These are immediate and long-term action. Immediate corrective actions include correction of documentation deficiencies or errors, repair of inaccurate instrumentation, or correction of inadequate procedures. The source of the problem can usually be corrected at the time it is observed. Long-term corrective actions can include correction of systematic errors in sampling or analysis, and correction of procedures producing questionable results. Corrections can be made through additional personnel training, instrument replacement, or procedural improvements etc.

All QA problems and corrective actions will be documented to provide a complete record of QA activities and help to identify needed long term corrective actions. Defined responsibilities are required for scheduling, carrying out, documenting, and ensuring the effectiveness of the corrective action. The following two sections describe the corrective action procedures to be followed in the field and laboratory.

10.1.2.1 Field Procedures

Field nonconformance conditions are defined as occurrences or measurements that are either unexpected or that do not meet established acceptance criteria and will affect data quality if corrective action is not implemented. Examples of nonconformance include issues such as:

- Incorrect use of field equipment
- Improper sample collection, preservation, and shipment procedures
- Incomplete field documentation, including chain-of-custody records
- Incorrect decontamination procedures
- Incorrect collection of QC samples

Corrective action procedures will depend on the severity of the nonconformance. In cases where field personnel implement immediate and complete corrective action, the corrective action will be recorded in the field logbook and summarized in the daily field progress report.

Nonconformance's that have a substantial impact on data quality require completion of a corrective action request form. An auditor or any individual who suspects that any aspect of data integrity is being affected by a field nonconformance may fill out this form. Each form is limited to a single nonconformance. If additional problems are identified, multiple forms will be used for documentation.

Copies of the corrective action request form will be distributed to the project managers, the field team leaders, and the project file. The project manager, and field team will meet to discuss appropriate steps to resolve the problem. Items to be discussed will include:

- Determine when and how the problem developed
- Assign responsibility for problem investigation and documentation
- Determine the corrective action to eliminate the problem

- Design a schedule for completing the corrective action
- Document and verify that the corrective action has eliminate the problem

The QA Manager can require data acquisition to be limited or discontinued until the corrective action is complete and the nonconformance is eliminated. The QA/QC Manager can also request the reanalysis of any or all data acquired since the system was last in control.

10.1.2.2 Laboratory Procedures

Internal laboratory procedures for corrective action and a description of out of control situations requiring corrective action are contained in the laboratory QA plan. At a minimum, corrective action will be implemented when any of the following three conditions occur:

- Control limits are exceeded
- Method QC requirements are not met
- Sample holding times are exceeded

Out of control situations will be reported to the project analytical coordinator. In addition, a corrective action report signed by the analyst, group leader and laboratory QA/QC Manager or designee will be provided to the project analytical coordinators.

10.2 REPORTS TO MANAGEMENT

A summary of the work will be recorded in the field book as described in Subsection 1.5.1. The project manager will stay in daily verbal contact with the field crew and will report progress to the SWDIV RPM.

11.0 SAP REVISION OR AMENDMENT

If circumstances arise that impact the original project DQOs, such as a significant change in work scope, this SAP may be revised or amended. The modification process will be based on EPA guidelines, direction from the DON and QA Officer, and will be in conjunction with *Environmental Work Instruction (EWI) #2, 3EN2.2, Review, Approval, Revision, and Amendment of Sampling and Analysis Plans (SAPs)* (SWDIV, 2001b).

12.0 REFERENCES

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TABLES

TABLE A.5-1
SAMPLE CONTAINER, PRESERVATION, AND STORAGE REQUIREMENTS FOR SOIL SAMPLES
UNDERGROUND STORAGE TANK 41319
MARINE CORPOS BASE CAMP PENDELTON

Parameters	Sample Size Requirements	Preservation	Storage	Holding Time
TPH-g[1]	Three EnCore™ soil sampling devices	EnCore™ Sampler; 4°C or freeze to –10°C	Store away from light	48 hours[4] or 7 days (if frozen)
TPH d	1-16 oz. Glass wide mouth jar	None; 4°C	Store away from light	14 days[2]/40 days[3]
TRPH	1-16 oz. Glass wide mouth jar	None; 4°C	Store away from light	14 days[2]/40 days[3]

Notes:

[1] - Samples collected for onsite analyses will be preserved in accordance with EPA Method 5035 and analyzed as soon as possible.

[2]- From sample collection to extraction

[3] From sample extraction to analyses

[4] From sample collection to analyses.

Table A.7-1
Reporting Limits, Preliminary Action Levels, Precision and Accuracy Objectives
Underground Storage Tank Site 41319, Marine Corps Base Camp Pendleton

Analyte	Soil Reporting Limit	Soil Preliminary Action Levels	Precision (RPD)	Accuracy (% Recovery)	
				MS/MSD	LCS
Unit of Measure	mg/kg	mg/kg	%	%	%
Total Petroleum Hydrocarbons (TPH) -U.S. EPA Method 8015M					
TPH-gasoline	10	10	30	67-125	67-125
TPH-diesel	10	100	30	67-125	67-125
Total Recoverable Petroleum Hydrocarbons (TRPH) -U.S. EPA Method 418.1					
TRPH	10	1000	30	75-126	75-126

Notes:

RPD = Relative percent difference as calculated by the pair of analytical duplicates

% Recovery = Percent recovery of spiked compounds

MS/MSD = Matrix spike/matrix spike duplicate

LCS = Laboratory control sample (blank spike)

mg/kg = milligrams per kilogram

TPH = total petroleum hydrocarbons

TRPH = total recoverable petroleum hydrocarbons

U.S. EPA = U.S. Environmental Protection Agency

Tab .8-1

Reporting Limits, Preliminary Action Levels, Precision and Accuracy Objectives
Underground Storage Tank Site 41319, Marine Corps Base Camp Pendleton

Analyte	Soil Reporting Limit	Soil Preliminary Action Levels	Precision (RPD)	Accuracy (% Recovery)	
				MS/MSD	LCS
Unit of Measure	mg/kg	mg/kg	%	%	%
Total Petroleum Hydrocarbons (TPH) -U.S. EPA Method 8015M					
TPH-gasoline	10	10	30	67-125	67-125
TPH-diesel	10	100	30	67-125	67-125
Total Recoverable Petroleum Hydrocarbons (TRPH) -U.S. EPA Method 418.1					
TRPH	10	1000	30	75-126	75-126

Notes:

RPD = Relative percent difference as calculated by the pair of analytical duplicates

% Recovery = Percent recovery of spiked compounds

MS/MSD = Matrix spike/matrix spike duplicate

LCS = Laboratory control sample (blank spike)

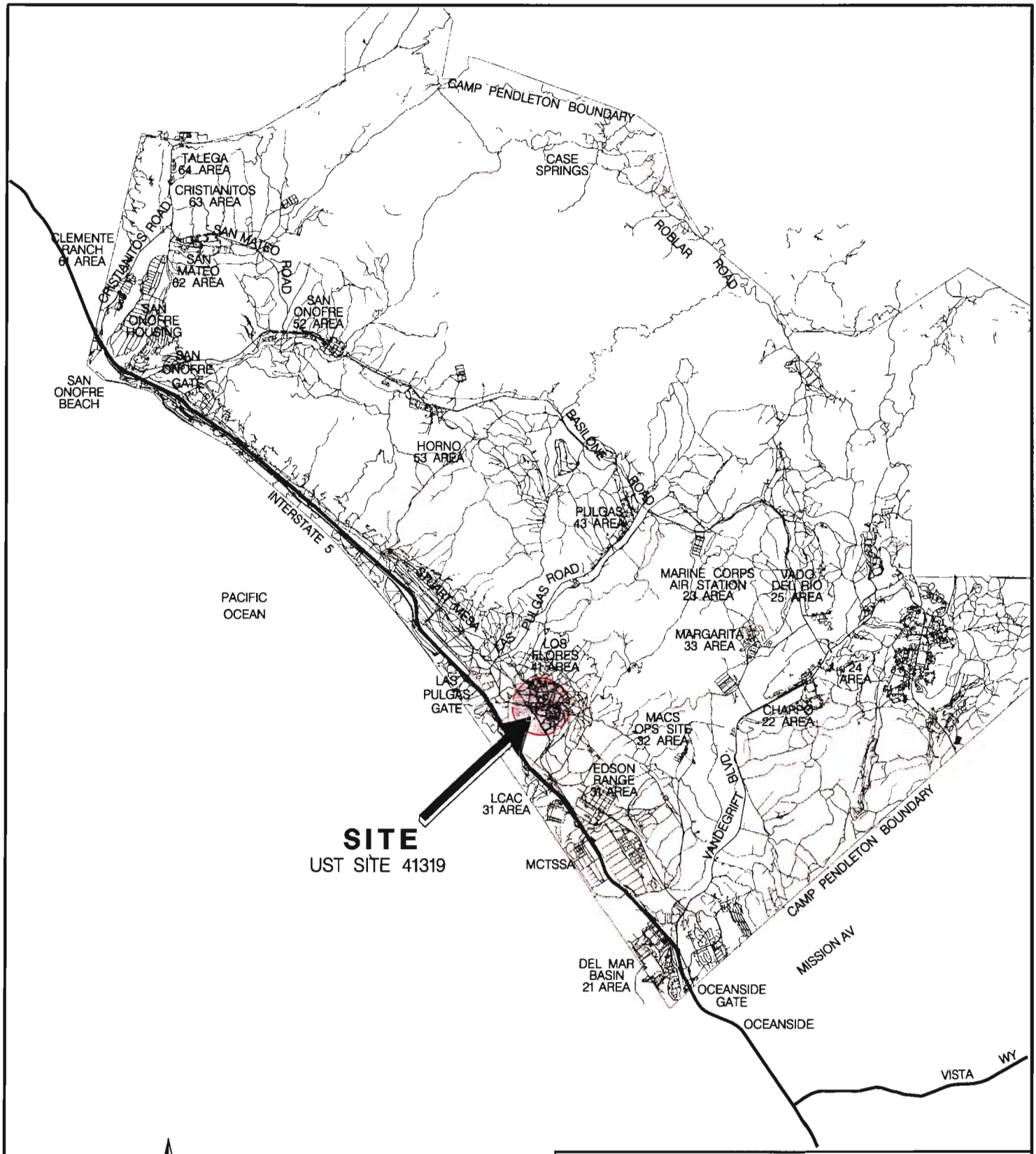
mg/kg = milligrams per kilogram

TPH = total petroleum hydrocarbons

TRPH = total recoverable petroleum hydrocarbons

U.S. EPA = U.S. Environmental Protection Agency

FIGURES



SITE LOCATION

UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/21/2004
File No. isl081.dgn

FIGURE 1–1

z:\islaiwa\isl0b...dgn

N

0 300 600

SCALE IN FEET

FORMER UST 41319
2,000-GALLON WASTE
OIL UST (REMOVED)

41253
41255
41327
41312
41362
41366
41303
EL CAMINO REAL
41319
41359
41348
41352
41356
41346
41344
41342
41350
41372
41371
41375
STUART MESA RD

SOURCE: NINYO & MOORE, 2000

SITE PLAN

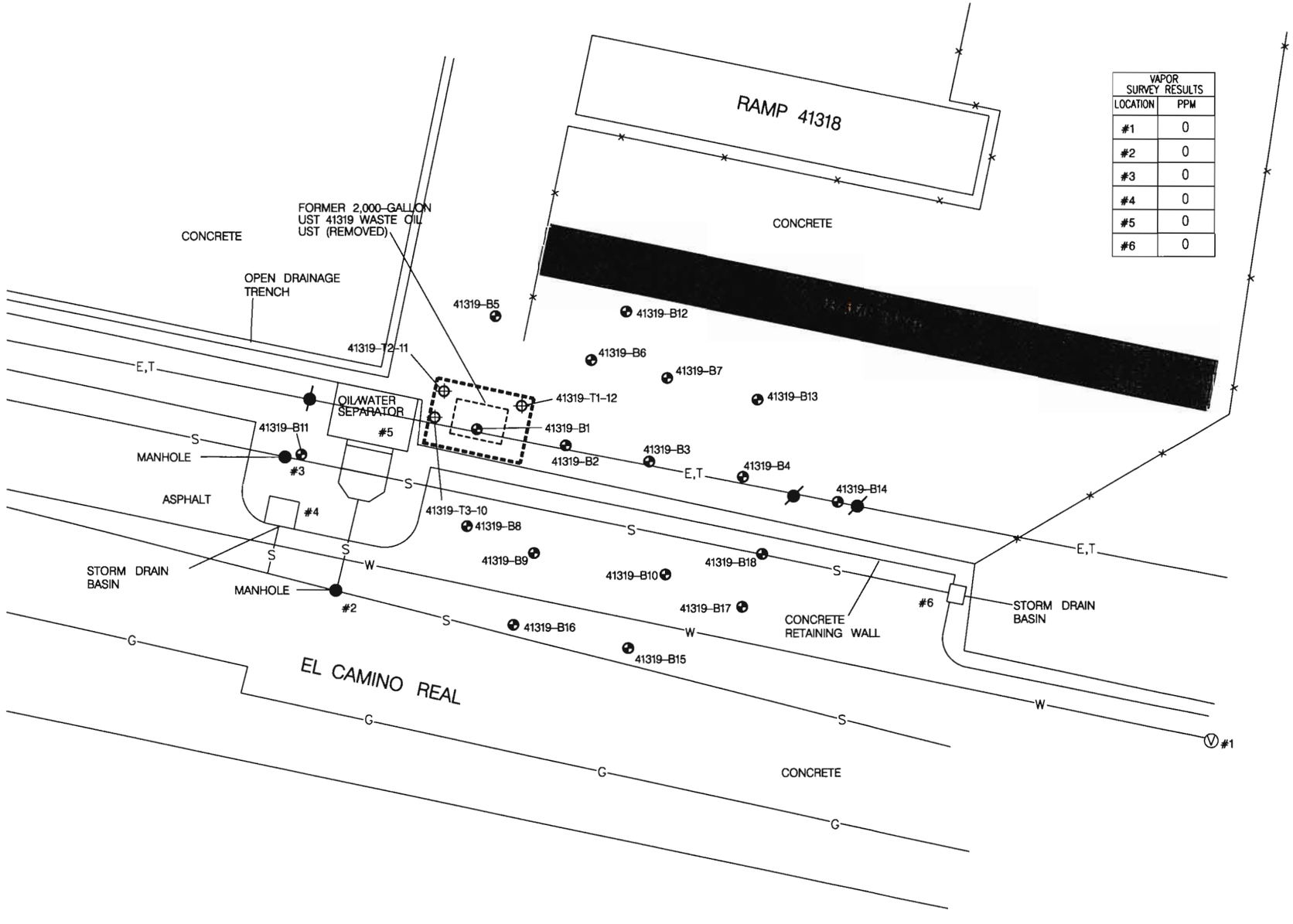
UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/21/2004
File No. isl082.dgn

FIGURE 1-2

z:\isla\wa\isl06...gn



VAPOR SURVEY RESULTS	
LOCATION	PPM
#1	0
#2	0
#3	0
#4	0
#5	0
#6	0

LEGEND

——W——S——	APPROXIMATE LOCATION OF UNDERGROUND STORM DRAIN/SEWER OR WATER LINE
---------G---------	APPROXIMATE LOCATION OF UNDERGROUND GAS LINE
C,E,T (ABOVEGROUND)	APPROXIMATE LOCATION OF ELECTRICAL TELEPHONE, OR CABLE TV CONDUIT
●	UTILITY POLE
Ⓥ	VAULT
▬▬▬	APPROXIMATE LIMITS OF FORMER UST EXCAVATION
—×—×—	FENCE
⊕	SOIL SAMPLE LOCATION (M.E.I., JULY 94)
⊕	SOIL BORING (NINYO & MOORE, NOV/DEC 1999 AND JAN 2000)
PPM	PARTS PER MILLION
VAPOR SURVEY RESULTS	MEASUREMENTS COLLECTED ON 28 APRIL 99 USING A PHOTOVAC 2020 PHOTOIONIZATION DETECTOR

N

0 20 40

SCALE IN FEET

SOURCE: NINYO & MOORE, 2000

PREVIOUS INVESTIGATION SAMPLE LOCATIONS

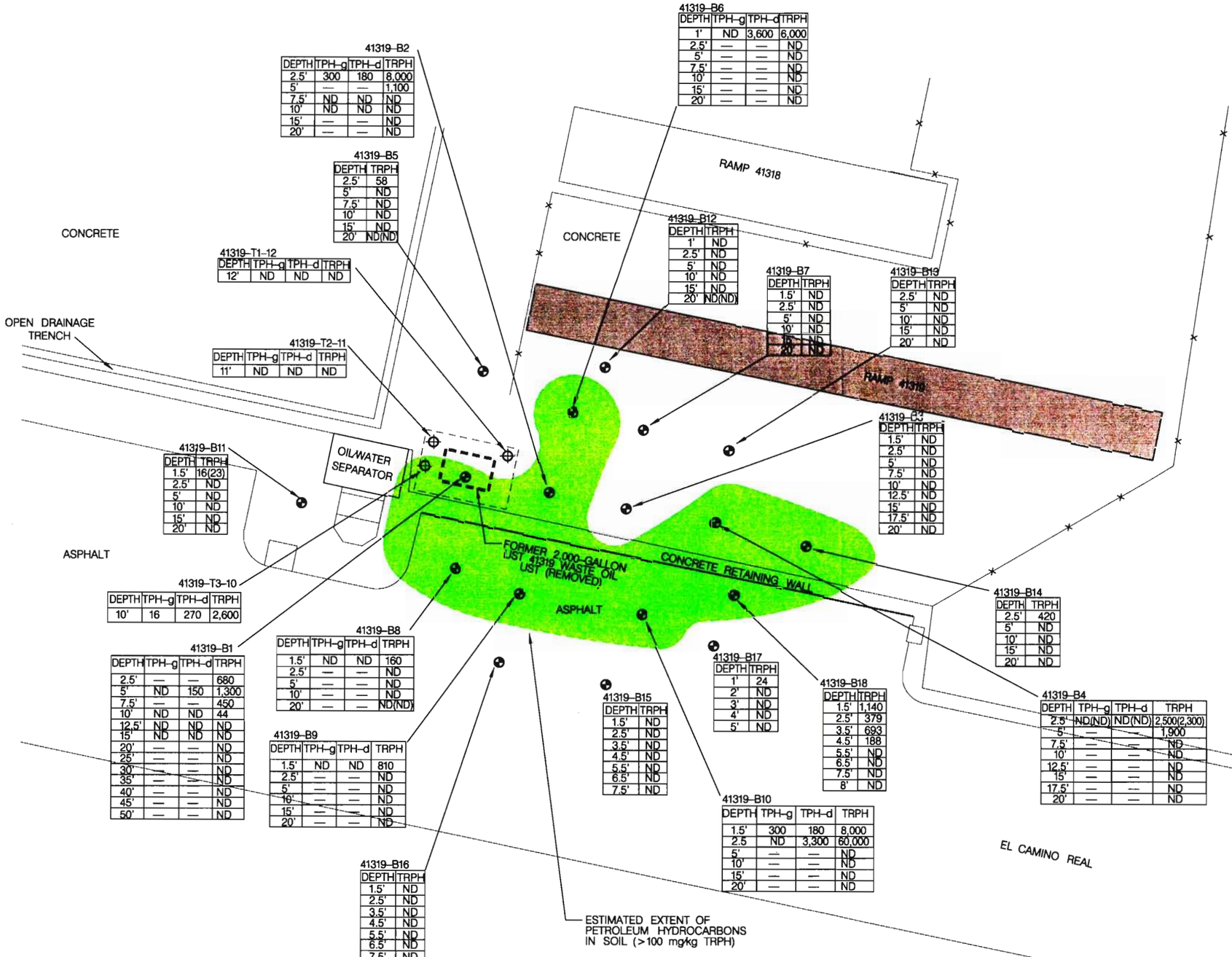
UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/21/2004
File No. isl083.dgn

FIGURE 2-1

z:\islaiwa\isl06.jgn



SOURCE: NINYO & MOORE, 2000

PREVIOUS SOIL SAMPLE ANALYTICAL RESULTS AND ESTIMATED EXTENT OF IMPACT

UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/21/2004
File No. isl064.dgn

FIGURE 3-1

z:\islaiwa\isl0L gn

DEPARTMENT OF THE NAVY – SOUTHWEST DIVISION
Naval Facilities Engineering Command

FINAL
HEALTH AND SAFETY PLAN

UST SITE 41319
MARINE CORPS BASE CAMP PENDLETON
CALIFORNIA
JUNE 4, 2004

Prepared by:
Navy Public Works Center San Diego

HEALTH AND SAFETY PLAN
FOR THE FIELD ACTIVITIES AT
MCB Camp Pendleton
UST Site 41319

REMOVAL
OF PETROLEUM CONTAMINATED SOILS

Prepared by:
Navy Public Works Center San Diego

NAVFAC
Naval Facilities Engineering Command

Signature: _____ Date: 4 JUNE 2004
Karen Collins
Project Manager

Signature: _____ Date: 4 JUNE 2004
Craig Haverstick
Project Health and Safety Officer

Navy Public Works Center, San Diego
Environmental Department
Underground Storage Tank Removal/Remediation Division
ASW, San Diego, California

Mayr25, 2004

1.0 INTRODUCTION

This Site-Specific Health and Safety Plan (HASP) has been prepared in conformance with the Navy Public Works Center San Diego (PWCSD) Health and Safety Program. It addresses on-site health and safety procedures that are intended to guide field activities at the project work site. This HASP establishes procedures to protect workers and the public from potential hazards posed by work at this site. Chemical and physical hazards which may be encountered at the job site are identified. The plan sets forth the various duties of key personnel involved on the job site during site investigations and related field work.

Elements of this plan include procedures for personal protection, personnel and equipment safety, medical surveillance, air quality monitoring, and general on-site work practices. Additionally, this plan contains provisions for emergency procedures, including emergency response and first-aid capabilities. Compliance with this plan is required by all Navy personnel, subcontractors, and third parties who enter the site. Site access for any person includes reading and signing the Log/Compliance Agreement Form.

The following criteria provide the basic standards for all site activities and this site health and safety plan. The criteria include instructions, regulations and guidelines, as excerpted from:

Commander Naval Bases San Diego Instruction 11320.1B, September 1990.

Navy Occupational Safety and Health Program Manual Instruction, 5100.23D, October 94.

PWC Occupational Safety and Health Program Manual, Instruction 5100.26B, January 1994.

United States Department of Labor Occupational Safety and Health Administration (OSHA), Title 29 Code of Federal Regulations, Parts 1910 (General OSHA Standards) and 1926 (Safety and Health Standards for Construction)

USEPA Standard Operating Safety Guides, June 1992.

NIOSH/OSH/OSHA/USCG/USEPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985.

United States Army Corps of Engineers, Safety and Health Requirements Manual, EM 385-1-1, September 1996.

Navy/Marine Corps Installation Restoration Manual, February 1997.

The body of this HASP is written as a generic document in modular form. Site specific information is provided as supplements and are included as Attachments, which are located at the end of this HASP. This HASP shall be considered complete only with all Attachments which include; emergency phone numbers, first aid information, a site map, the hospital address and route, and the daily site log/compliance agreement form.

This plan is based on the best available information and has been written for exclusive use by PWC employees and sub contractors. This plan may be amended should site conditions, procedures, or personnel change. PWC claims no responsibility for use of this plan by others.

2.0 WORK DESCRIPTION

The work to be conducted on this project is detailed in the Work Plan. A summary of project activities included in this HASP involves the following:

Remove impacted soil from the vicinity of the former bldg 41319 underground storage tank (UST 41319).

Obtain representative soil samples for laboratory analysis

Remove contaminated soil from the site. Backfill and compact excavations. Perform basic surface restoration as required.

Excavate the petroleum contamination to concentrations below action levels.

Remove and dispose of asphalt and concrete surfaces.

Perform continuous workplace monitoring and remedial excavation documentation to demonstrate, as needed, compliance with occupational and environmental health and safety standards. This includes but is not limited to controlling traffic, dust, organic vapors, noise, use of personal protective equipment, and stormwater runoff pollution prevention.

3.0 KEY PERSONNEL

3.1 Project Manager

Karen Collins, with PWC Code 980 is the Project Manager (PM), and will serve as the primary point of contact. PM responsibilities include project scheduling, cost updating, overall project direction, and overseeing site safety. In addition, the PM is responsible for determining the extent and level of input required for technical issues that arise during the tenure of the project.

3.2 Project Health and Safety Officer

Craig Haverstick, with PWC Code 980 is the Project Health and Safety Officer (PHSO), and will be responsible for review and approval of the HASP, and will advise or direct the site safety activities of the Project Site Safety Officer (SSO). Jon Desmond, with PWC Code 980 will act as the alternate PHSO. The PHSO has the authority to stop unsafe operations, remove unqualified personnel from the work area, and approve changes to the HASP. The PHSO may be requested to act as the SSO for the PM.

The PHSO is responsible for integrating all aspects of the HASP development and implementation. PHSO duties include reviewing the SSO implementation of the HASP, advising the SSO on all related Health and Safety aspects, reviewing any site Specific Plans for compliance and completeness, as well as establishing and monitoring all related Health and Safety procedures through site safety audits.

3.3 Project Site Safety Officer

Craig Haverstick is the Project Site Safety Officer (SSO). The SSO duties include: 1) assuring that appropriate safety equipment is available and utilized as necessary to fulfill plan provisions; 2) performing safety monitoring; 3) establishing the exclusion, decontamination and support zones; 4) documenting accidents, incidents, or plan non-compliance issues, and 5) initiating emergency response procedures when necessary.

Prior to commencement of work, the SSO will review plan requirements with all personnel on-site. The review will include a site-specific briefing with workers on 1) potential physical and chemical hazards that could be encountered, 2) expected safe work practices to prevent accidents or hazards to workers and others in the project area, 3) directions to nearest medical facility, 4) site evacuation procedure applicable to the project and 5) a general overview of the plan. It is the responsibility of the workers to read this plan before signing the Daily Site Log/Compliance Agreement Form.

The SSO will conduct the daily safety meetings and will interface as required with other site representatives. The SSO performs duties such as confirming personnel are fit for duty, coordinating emergency medical care, posting daily air monitoring results, conducting a daily site safety inspection, and inspecting health and safety equipment. The SSO is certified in First Aid and CPR.

A safety log will be kept for all activities. This log will include daily safety meeting topics, training given, air monitoring information, first aid administered, visits of all outside personnel and any incidents of a health and safety nature. The SSO will investigate all accidents and prepare an accident investigation report that will be forwarded to appropriate regulatory agencies depending on the nature and severity of the accident or injury. Project Safety Inspections will be conducted daily by the SSO and/or the Site Superintendent.

The SSO is responsible for on-site implementation and enforcement of the site safety program and procedures. SSO will oversee any personnel monitoring and will decide when action levels have been reached which require more stringent personnel protection. The SSO will maintain contact with the Project Health and Safety Officer at least weekly.

3.4 Project Site Superintendent

In the absence of the PM, PHSO, or SSO, a PWC Code 980 representative will be designated as the Site Superintendent (SS). The SS will be responsible for all field activities and enforces safe work practices by all crew members. SS watches for any effects on crew members, especially those symptoms possibly caused by heat stress or chemical exposure. The SS maintains communication with Project Manager, SSO and client representative(s). The SS temporarily assumes the duties and responsibilities of the SSO and oversees the safety of any visitors who enter the site when SSO is not on site.

3.5 Project Radiation Safety Officer

The Radiation Safety Officer (RSO) for C980 projects will be Joel Baumbaugh, from NRAD Code 0382. Contract personnel, Protech, can provide on-site screening as necessary. For any radiologic artifacts found, the RSO will be responsible for assisting with work area having elevated levels of radiologic activity. He will instruct the workers on precautions when around and responding to any suspected radiologic artifacts which may be uncovered. The RSO will maintain contact with the Project Health and Safety Officer at least weekly.

3.6 Employee Safety Responsibility

In accordance with PWC Instruction 5100.26B, Chapter 2, OSH Responsibilities; although the employer is responsible for providing a safe and healthful workplace, each employee is responsible for his/her own safety as well as the safety of others on the work site. The employee shall use all equipment provided in a safe and responsible manner to achieve the intent of the HASP. All project personnel working at the site will be responsible for understanding and complying with the Health and Safety Plan requirements and all on-site personnel will have assigned responsibilities.

3.7 Visitors

All site visitors will be required to read the HASP and sign the Daily Site Log / Compliance Agreement Form. Visitors will be expected to comply with relevant OSHA requirements and provide their own PPE required by the HASP. Any visitors who do not adhere to the provisions of the HASP will be requested to leave the work area. Visitors who have not met OSHA training and medical surveillance requirements are not permitted to enter areas where exposure to hazardous materials is possible. Exceptions will be strongly discouraged, but they will be made on a case by case basis under the following conditions: (1) respirators are not required, (2) the visitor's time on site is limited, (3) the visitor is given a pre-entry briefing, (4) visitors are accompanied by trained personnel at all times, and (5) PHSO or SSO approval is obtained.

4.0 SITE HAZARD EVALUATION

In accordance with PWC Instruction 5100.26B, Chapter 5, Prevention and Control of Workplace Hazards, site hazards must be identified and eliminated or controlled as best as possible. Many activities to be performed in this project are investigative in nature. Physical, chemical and biological hazards may be encountered on the site. The most likely hazards include those associated with operating mechanical equipment and dealing with potentially hazardous chemicals. The most immediate hazard is that of physical injury to on site personnel from machinery. Contaminated soil with volatile organic compounds (VOCs), semi-volatile hydrocarbons (Semi VOCs), heavy metals and radiologic artifacts may be encountered on the surface and subsurface soils at the site, as well as the groundwater. The hazard potential associated with the presence of these contaminants escaping into the work area is primarily from excavation, sampling and any investigative work deemed necessary.

4.1 Exposure Pathways

The potential for exposure to ***nuisance dust and odors*** during field activities exists at all work tasks and may occur through inhalation, dermal contact, and ingestion. Inhalation of the any airborne material is of critical importance. Physical contact with during on-site work tasks is the principal pathway of exposure to the heavy metal compounds and nonvolatile hazardous materials. Ingestion of hazardous materials usually occurs because of lack of proper hygiene or decontamination.

The requirement to use personal protective equipment (PPE) combined with the requirement to wash arms, face, and hands before eating or smoking should prevent exposure through inhalation, dermal or ingestion pathways. Further discussion regarding the measurement of organic vapors during work activities, the types and conditions for use of PPE, safe operating procedures and decontamination are described in Sections 6.0, 5.0, 8.0 and 10.0 respectively.

4.2 Chemical Hazards

The chemicals listed in Table 4-1 may be encountered during site activities. Material Safety Data Sheets (MSDS) for any additional chemicals found on site or brought onto site will be acquired and reviewed with all personnel during daily safety meetings. Levels of protection and air monitoring requirements will be based initially on the data provided or obtained prior to commencing work. These requirements may be subject to change as site conditions are more fully evaluated when work is underway.

The PSHO, SSO and SS shall observe and warn the crew members to be aware of the initial symptoms of chemical exposure. The amount of exposure depends primarily on the specific activities undertaken and the care with which the activities are performed. Any crew member will be removed from the work site and medically evaluated if the following initial symptoms are observed to persist and are unexplained by other causes (such as allergy, common cold, heat stress etc.):

* Dizziness or stupor
* Irritation of the eyes, nose or throat
* Euphoria
* Chest pains and coughing
* Rashes or burns
* Nausea, headache or cramps

4.3 Physical Hazards

There are numerous physical hazards associated with this project which could result in accidents and personal injury to the work force as well as operational problems. To minimize physical hazards, standard safety instructions have been developed which will be followed at all times, the full content of which can be found in the PWC Instruction 5100.26B. Failure to follow safety protocols or continued negligence of these policies will result in removal of a crewmember from the site.

All personnel must be familiar with the field activities, which will be conducted at the site and must be trained to work safely under various field conditions. Besides the PM, PHSO and SSO, the Base Environmental Department staff is notified of all activities and field representatives may come onsite, unannounced, to observe the general work practices of each crew member and equipment operators, and enforce safe procedures if necessary. To minimize physical hazards, hard hats, safety glasses, and safety shoes will be required in all areas of the site.

The potential physical hazards during this site work includes the following:

4.3.1 Confined Space Entry Hazards

No confined space entry is anticipated for this project. A confined space is any enclosed area having oxygen content less than 19.5% or where limited means of egress where ventilation is not adequate to remove a toxic or flammable atmosphere. If needed, a confined space entry permit will be obtained in accordance with PWC Instruction 5100.26B, Chapter 27. The PM or PHSO shall scheduled this activity with the CNR Safety Office Confined Space Program Manager (CSPM), Jerry Welch. The PM or PHSO shall notify the CSPM of the dates and times of these activities, as well as ensure provisions for ventilation and proper safety harness and/or associated safety equipment is employed prior to entry. Additionally, the PM, PHSO or SSO will continue to monitor both the air inside and the condition of the personnel within the confined space to ensure safe working practices

4.3.2 Underground & Overhead Utilities

Underground activities are not expected on this project. If necessary, prior to starting intrusive activities, all known underground utilities and lines shall be located and marked on the ground and on a site map by either PWC Utility Locators or a Dig Alert service, in accordance with PWC Instruction 11300.3l (10 May 1994) and any utility outages shall be performed in accordance with 11300.6D (7 November 1989). The initial site safety orientation meeting for all personnel working on-site shall include a review of the site map with underground utility locations clearly marked. The site safety orientation shall include a site walkover of each marked utility or line.

During the performance of work, should PWC personnel encounter a subsurface condition that creates suspicion that there may be an unidentified underground line or utility, work will immediately cease and the activity knowledgeable of the utility will be notified.

Overhead power lines may present a hazard to equipment and personnel. To prevent equipment contact with power lines and to prevent arcing, adequate clearance must be maintained. For lines rated 50KV or below, the minimum clearance between the lines and any part of the crane or load shall be 10 feet. For lines rated over 50 KV, the minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inches for each KV over 50 KV. The minimum clearance distances discussed in this section are derived from NAVFAC P-307, Paragraph 10.11.1 and Figure 10-3.

4.3.3 Electric Hazards

No electric tools are expected to be used onsite. In accordance with PWC Instruction 5100.26B, Chapter 16, Occupational Safety and Health Standards and Chapter 24, Energy Control Program, electrical

hazards must be controlled since contact with electrical current can cause shock, electrical burns, and can be instantly fatal. The potential for exposure to electrical current exists through contact with electrical tools or equipment, generators, electrical control equipment and overhead/underground power lines. Care must be taken to avoid contact with sources of electricity. Work will cease if lightning is observed or expected to occur.

To prevent accidents caused by electric shock, the PM or PHSO will inspect all electrical connections used during this project on a daily basis. Any equipment which is found to have frayed or loose connections or not properly grounded via Ground Fault Circuit Interrupters (GFCI), will be shutdown and locked out until a qualified electrician can be contacted. The equipment will be de-energized and tested before any electrical work is done. GFCIs will be installed for each outdoor circuit to be used and any portable generators needed to supply power will contain GFCIs to be used between the power source and tool.

4.3.4 Hand Injuries

PWC Instruction, 5100.26B, Chapter 20, Personal Protective Equipment, discusses providing approved safety equipment, including hand protection. Hands may be exposed to hazards as those from skin absorption of harmful substances; severe cuts or lacerations, severe abrasion; punctures; chemical burns, thermal burns and harmful temperature extremes. Personnel will be instructed not to engage in any activities that can expose the hands without prior discussion with the PM, PSO, or SSO to ensure the proper selection of hand protection. At a minimum, personnel shall be issued a pair of leather work-gloves and several pairs of chemical protective gloves.

4.3.5 Foot Hazards

PWC Instruction 5100.26B, Chapter 20, Personal Protective Equipment, discusses providing approved safety equipment, including safety shoes. Trades generally associated with foot or toe hazardous operations include, construction, materials handling, maintenance, transportation, repair and overhaul, explosive manufacturing, and such. Personnel shall be instructed to wear approved safety shoes during all field activities.

4.3.6 Falling Object Hazards

PWC Instruction, Chapter 20, Personal Protective Equipment, discusses providing approved safety equipment, including hard hats. Hard hats provide protection from the impact of falling and flying objects and from limited electrical shock and burn. Personnel shall be instructed to wear approve hard hats during all field activities with posted head protection signs. As minimum requirement, hard hats will be worn when working around heavy equipment.

4.3.7 Hot Work (Welding/Cutting)

Hot work is not anticipated during the course of this project, however the topic is presented in the event any welding or cutting is necessary. All hot work will be performed according to the Federal Fire Department's Hot Work Permit Program, as directed by the Commander of Naval Base San Diego Instruction 11320.1B (5 September 1990). If the work area constitutes a confined space, any hot work performed shall also conform to the PWC Safety Confined Space Entry Permit requirements. It is important to note that any contractor performing hot work on this job shall also obtain a Federal Hot Work Permit.

The PM or PHSO shall ensure the welder coordinates with the MCB Camp Pendleton (760-763-2771) Federal Fire Prevention staff to obtain the hot work permit. A copy of the hot work permit is provided to the welder and the original is kept at the individual base Fire Prevention Bureau office up to five years.

4.3.8 Excavation/Trenching

Any excavation or trenching operation that is four feet or more in depth will be performed in accordance with the PWC Excavation Permit Procedures as described in the PWC Instruction 11300.1 (28 February 1994). A competent person must complete an excavation permit before excavation commences. The PHSO is qualified as competent persons for excavations. This permit will require daily inspections of the operation and adjacent areas to specifically identify: possible cave-in, failure of protective systems (benching, sloping, or shoring), hazardous atmospheres and other hazardous conditions. If any person finds evidence of these situations, the PM or PHSO shall ensure that exposed employees are removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

4.3.9 Sight Hazards

PWC Instruction 5100.26B, Chapter 19, Sight Conservation Program discusses eye hazardous areas and operations and issue of eye protective equipment. Flying particles and chips during soil removal and loading; splashes from decontamination liquids; welding glare, and such can cause eye and face injury. Personnel shall be instructed to wear approved eye protective equipment whenever working on this project and when entering a posted eye hazard area.

4.3.10 Vehicular Traffic Hazards

Non-construction related traffic will be diverted by marking off the area with cones, barriers, tape, and signage indicating construction zone. Personnel needing to work near or around high traffic areas will be required to wear safety vests with bright orange or fluorescent markings.

PWC Instruction 5100.26B, Chapter 14, Mishap Investigation and Reporting, outlines the reporting requirements for motor vehicle mishaps and property damage. Driving to and from job sites, finding an acceptable parking space, construction related detours and poor weather conditions typically causes vehicular traffic hazards. Personnel will be instructed to avoid and respect rules for areas marked off with cones, barriers, tape, and signage indicating construction zone

4.3.11 Tripping/Falling Hazards

PWC Instruction 5100.26B, Chapter 10, Reports and Records of Violations and Unsafe/Unhealthful Conditions, states that all employees are invited to report, orally or in writing the hazard or unsafe practice. Poor housekeeping, resulting in debris, job supplies equipment and materials not in respective storage locations or stockpiles without adequate aisle space typically causes tripping hazards. Personnel will be instructed to avoid walking in such areas and advise others to remove such hazards. To minimize tripping hazards caused by debris, job supplies, equipment and materials will be removed daily from the work areas and stockpiled in their respective storage locations. This housekeeping effort will be enforced by the PM, PHSO, or SSO throughout the day.

4.3.12 Back Injuries

PWC Instruction 5100.26B, Chapter 23, Ergonomics Program, identifies the enforcement of safe work practices and requires the reporting of symptoms of ergonomic stress or injury. Personnel will be instructed not to engage in any lifting and advise others not to lift heavy items without assistance.

4.3.13 Noise Hazard

Exposure to high levels of noise, both chronic and acute, can lead to different types of reactions. Acute (impulse) noise, such as noise associated with the operation of power tools, vacuum equipment, excavation equipment, crane and rigging equipment and jackhammers, can afflict the operator and persons nearby with a temporary loss of hearing at certain frequencies associated with the equipment being used. Ordinarily, this loss is reversible and after a short period of time (less than a day) the hearing will return to normal. However, chronic exposure to this noise may eventually cause the hearing acuity to be permanently and irreversibly altered. The change may be subtle and could occur over a period of time.

Permanent noise-induced hearing loss is attributed to the intensity and frequency distribution of the noise, the time pattern and duration of exposure, and individual susceptibility. Sound levels (noise) are measured in decibels (dB) with an A-weighted range. In accordance to PWC Instruction 5100.26B, Chapter 18, Hearing Conservation Program, the Navy's Permissible Exposure Level (PEL) Threshold Limit Values (TLV) for noise exposure is 84dB(A) for an 8-hour duration and 89 dB(A) for a 4-hour duration. This instruction also requires equipment known to produce peak noise levels greater than 140dB(A) to be labeled with hazardous warning decals. Hearing protective devices shall be worn by all PWC Code 980 personnel when working within 12 feet of any marked equipment so that PELs will not be exceeded.

4.3.14 Explosion / Fire Hazard / Unexploded Ordnance

With the exception of petroleum hydrocarbons, explosion and fire hazards are not anticipated for this site. Regardless, ignition sources of any kind (e.g., cigarettes, open flames, engines, impact sparking, and heat or arc from inappropriate equipment or instrumentation) pose a major explosion and fire hazard. If soil saturated with volatile compounds are found, air monitoring for volatile organic vapors will be conducted to evaluate the hazard.

If any unexploded ordinance (bullet casing inside a cartridge) is found, PWC will notify the Explosive Ordinance Detail (EOD) (760) 725-5498. If there is any doubt, excavation activities will be stopped, otherwise, unexploded ordinance will be segregated and secured for removal by EOD.

4.3.15 Heavy Equipment Operation Hazards

The principal type of injury expected during operation of heavy equipment includes the potential for falls, and adverse contact with tools, and moving or rotating equipment. Injuries resulting from physical hazards can be avoided by adopting safe work practices and by employing caution when working with machinery. PWC subcontractor-authorized personnel that are trained-in and familiar-with the equipment, its operation and safety provisions, will perform maintenance and operation of this equipment.

4.3.16 Heat Stress Hazard

Exposure to an environment that is excessively hot is not anticipated at this site. However, the occurrence of heat stress depends on such factors as environmental conditions, clothing, workload, an on-site worker's physical condition, and the type of PPE required for the work task. Some types of PPE are heavy, increase the body's expenditure of energy, and reduce the efficiency of the body's normal heat exchange mechanisms.

If it is determined that heat stress may occur because temperatures exceed 70^0F and/or the use of chemical protective clothing is causing an increase in the workers' body temperature, the PM or PHSO will ensure that adequate liquids are provided to replace lost body fluids. These liquids can be water, commercial mixes combined with potable water, or commercial liquids. Depending on the degree and nature of possible heat stress that will be encountered, the PM or PHSO will choose from the following heat stress control actions:

a) Establish a work regimen that will provide adequate rest periods to allow for cooling down. This action may require additional shifts for workers or earlier or later work schedules. The work regimen may need to be established based on oral temperature or heart rate. Workers shall not be permitted to continue work when oral temperatures exceed 100.4^oF, or when the resting heart rate continually exceeds 100 beats per minute.
b) Provide cooling devices to be worn beneath protective garments.
c) Require removal of impermeable protective garments during rest periods.
d) Ensure that all rest period are taken in a shaded rest area, if possible.

e) Regulate rest periods, and ensure that workers will not be assigned other tasks during rest periods.
f) Notify all workers of health hazards and the importance of adequate rest, acclimatization, and proper diet; teach workers to recognize heat stress related symptoms and the appropriate first aid for heat rash, heat cramps, heat exhaustion, and heat stroke.

4.3.17 Cold Stress Exposure

Exposure to an environment that is excessively cold is not anticipated at this site. However, low temperatures and/or a wind chill adjusted temperature of 10°F or less are conditions where cold stress is a concern. The PM or PHSO will monitor workers during all rest periods and site activities for signs of cold stress. Self-monitoring and co-worker monitoring will also be encouraged. The following are cold stress preventive measures that may be implemented by the PM or PHSO:

a) Establish a work regimen that will provide adequate rest periods to allow for warming up.
b) Require use of thermal socks, underwear, hard hat liners, and other cold-weather gear to help prevent hypothermia.
c) Require the removal of perspiration-soaked clothing in a warm area. This action prevents rapid cooling of the body for workers in chemical-resistant equipment.
d) Ensure that all rest periods are taken in a warm area, if possible.
e) Ensure that workers are provided with blankets and warm drinks during rest periods.
f) Teach workers to recognize cold stress related symptoms and the appropriate first aid for frostbite, hypothermia, and trench foot.

4.4 Biological Hazards

The following biological hazards are not anticipated to be onsite but always pose a risk to personnel and as such are discussed:

Animal bites and insect stings can cause localized swelling, itching, and minor pain that can be handled by first aid treatment. However, sensitized individuals can experience more serious effects such as anaphylactic shock. This type of shock can lead to severe reactions in the circulatory, respiratory, and central nervous system, and in some cases, even death. Snakebites will be handled as an emergency requiring calling for an ambulance. The Project Health and Safety Officer will identify personnel with a known reaction to bites and stings at the safety orientation meeting. No attempts should be made to capture any wild or semi-wild animals due to the possibility of a bite or parasitic infestation.

Animal and bird droppings often contain mold, fungus, or bacteria which represent a significant respiratory hazard including lung diseases and allergies. For example, the hanta virus is known to be transmitted by exposure to rodent droppings and is known to occur in the San Diego area. Personnel will be instructed not to touch visual droppings, and to wear gloves and Tyvek at a minimum when going into limited access areas such as crawl spaces and high ceiling that may have become refuges or nesting areas. Good hygiene practices will help to minimize the potential for exposure to these hazards.

4.5 Radiologic Hazards

No radiologic hazards are expected on this project. However during other C980 projects, point sources such as radium sources most likely originated from broken or crushed radium dials have been found. Thus a radiologic dust inhalation hazard is presumed to be present. Mitigation measures will include evacuating crews from the immediate vicinity until the point source has been isolated and placed into lined 55-gallon steel drum. Any hot spots and or soils with elevated readings were segregated and will be disposed of separately. Any person entering the area and handling a point source that is encountered shall wear an air purifying respirators, equipped with P100 cartridges or a combination cartridges (organic vapors and high efficiency particulate air filters) or P100 cartridges.

4.6 Task-Specific Hazard Analysis

The task specific hazard analysis is conducted prior to work commencement and is based on available information. These analyses are intended as initial guidance for starting the individual tasks. The hazard analysis will be revised as needed, depending on work conditions and as additional requirements are encountered. Any changes to the hazard analysis will be noted on the field copy of the Health and Safety Plan, with notations as indicating the directions provided to onsite personnel, as well as the individual, date and time such changes are determined to be necessary.

Task:

AST& UST Removal/Over-Excavation of Petroleum Contaminated Soils

Specific Hazards:

1. Vehicular or foot traffic in immediate vicinity.
2. Encountering underground and/or overhead utilities.
3. Ergonomic hazards from operation of heavy equipment.
4. Noise hazards from surrounding environment.
5. Chemical hazards via contact or inhalation at ground and soil interface.
6. Nuisance odors drifting to surrounding vicinity.
7. Ponded product or shallow groundwater.

Precautions/Controls:

1. Use fluorescent vests for persons working around or controlling vehicular traffic. Mark-off work area with barrier tape, cones, or other devices. Prohibit any person from entering area without proper safety equipment and ensure presence of a safety observer.
2. Obtain underground utilities clearance prior to start of excavation work and observe safe distance from marked areas.
3. Competent person to use augering equipment and ensure proper ergonomic positioning.
4. Ensuring use of hearing protection and proper ergonomic position.
5. Prohibit persons from placing face in or near ground and soil-ground interface unless air monitoring indicates a negative exposure assessment.
6. Petroleum products have a very low odor threshold. Vanilla misting maskant will be applied during excavation and truck loading activities and in response to any odor complaints.
7. Ensure vacuum trucks are readily available to remove ponded product or water in excavations.

Task:

Monitoring Well Installation

Specific Hazards:

1. Vehicular or foot traffic in immediate vicinity.
2. Heavy Equipment (drill rig) physical hazards
3. High noise levels within proximity of heavy equipment or surrounding activities.
4. Chemical exposure to contaminated soil.

Precautions/Controls:

1. Set up barriers around work zone. Use fluorescent vests for persons working around or controlling vehicular traffic.
2. Provide adequate clearance from drill rig or other heavy equipment swing areas.
3. Use hearing protection when exposed to excessive noise levels.
4. Prohibit persons from placing face in or near ground and soil-ground interface unless air monitoring indicates a negative exposure assessment.

Task:
Soil, Groundwater and Monitoring Well Sampling

Specific Hazards:
1. Vehicular or foot traffic in immediate vicinity.
2. High noise levels within proximity of heavy equipment or surrounding activities.
3. Chemical exposure to contaminated soil.

Precautions/Controls:
1. Set up barriers around work zone. Use fluorescent vests for persons working around or controlling vehicular traffic.
2. Use hearing protection when exposed to excessive noise levels.
3. Wear chemical protective gloves and have air-purifying respirators readily available. Follow safe handling techniques. Previous air monitoring events for similar activities have indicated a negative exposure assessment for organic vapors and heavy metals, although direct and indirect air monitoring may be conducted upon request, during site inspections and randomly.
4. Work shall be performed in accordance with Code 980 Standard Operating Procedures.

Task:
Cleanup of Debris, Building Demolition & Concrete/Asphalt Stripping

Specific Hazards:
1. Vehicular or foot traffic in immediate vicinity.
2. Encountering overhead utilities when demolishing structures
3. Noise hazards from operation of heavy equipment and surrounding industrial activity.
4. Ergonomic hazards from operation of heavy equipment.
5. Nuisance dusts or odors drifting to surrounding vicinity.
6. Silica dust from concrete crushing.
7. Unexploded ordnance.

Precautions/Controls:
1. Use fluorescent vests for persons working around or controlling vehicular traffic. Mark-off work area with barrier tape, cones, or other devices. Prohibit any person from entering area without proper safety equipment and ensure presence of a safety observer.
2. Observe safe distance from marked areas and overhead utilities.
3. Don hearing protective equipment when near or operating heavy equipment.
4. Competent person to use heavy equipment and ensure proper ergonomic positioning.
5. Suppress nuisance dusts with water spray. Mask nuisance odors with vanilla spray concentrate.
6. Provide water spray dust suppression if extensive concrete crushing is to occur.
7. If any unexploded ordinance (bullet casing inside a cartridge) is found, PWC will notify the Explosive Ordinance Detail (EOD) (760) 725-5498. If there is any doubt, activities will be stopped, otherwise, unexploded ordinance will be segregated and secured for removal by EOD.

5.0 GENERAL HEALTH AND SAFETY REQUIREMENTS

5.1 Medical Monitoring of Personnel

In accordance with PWC Instruction 5100.26B, Chapter 8, Occupational Health, medical monitoring of all PWCSD work force personnel is determined based on the results of industrial hygiene surveys and is exposure driven. In the absence of industrial hygiene data, medical personnel will make a decision on placement in medical surveillance programs based on knowledge of the workplace, job requirements and review of employee's occupational history. If necessary, physicals or stressor-specific evaluations will be performed by a qualified physician. Subsequent exams are performed as frequently as medical authorities determine is necessary for the safety of the individuals involved. PWC's medical consultants will determine the content of the physical. At a minimum, all PWCSD employees at the site shall be medically cleared to wear an air-purifying respirator.

5.2 Restricted Access Work Zone

Regulated areas: For each phase of the project, the work area will include three separate zones: an exclusion (~hot~) zone, a contamination reduction (decon) zone, and a support zone.

5.2.1 Exclusion Zone

Consists of in vicinity of any augering and sampling activities. Particular concern will be at the subsurface of the soil. All employees will use appropriate personal protective equipment PPE when working in those areas. The exclusion zone will be defined as an area where there is a possible respiratory and/or contact health hazard. In most instances this area will be a ten meter radius from the excavation. Cones, yellow caution tape, or other appropriate means will identify the location of exclusion zones.

5.2.2 Contamination Reduction Zone (decon area)

All personnel entering or leaving the exclusion zone will pass through this area in order to prevent any cross contamination and for the purpose of accountability. Decontamination will be performed in the contamination reduction zone. Tools and any equipment or machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the exclusion zone. Personal protective outer garments and respiratory protection will be removed in the contamination reduction zone and properly labeled.

5.2.3 Support Zone

Consists of an area outside the contamination reduction zone. The support zone will be located to prevent employees from being exposed to any organic vapors or particulate levels above regulatory limits. Eating, drinking, or smoking will be permitted in the support area only after washing face and hands.

5.2.4 Work Limitations

Work limitations include the following:
-No eating, drinking or smoking on site.
-Eye protective equipment must be worn by all persons.
-Facial hair must not interfere with the fit of the respirator.
-Work to be conducted during day light hours except in an emergency.

5.3 Safety Orientation Meeting

All field personnel must attend a safety orientation meeting before commencing the field work. The meeting will be scheduled and conducted by the PM, PHSO, and the SSO. The meeting will include presentation of the Health and Safety Plan and receipt of the required signed releases by the SSO.

5.4 Protective Equipment and Clothing

All on-site personnel will be equipped with personal protective equipment appropriate for the hazardous material being handled and the nature of the work being completed in accordance with ENVIRDEPT SOP#980-98-CPC (Chemical Protective Clothing and Equipment). The levels of personal protective equipment to be used for work tasks have been selected based on known or anticipated hazards and expected concentrations of materials found on the site.

Due to the nature of the job and expected types and levels of contamination, minimal protection consisting of Level D personal protective equipment will be required during most activities. Modified Level D may be used at any time, most likely during sampling activities. Decisions concerning upgrading or downgrading the level of protection will be made by the SSO who will then provide appropriate documentation to the PHSO or PM.

5.4.1 Level D Protection

Level D protection will be used where there is no exposure to splashes or spills, and where there is no measurable concentration of gases, vapors, or dust which require the use of chemical protective clothing. The protective equipment required under Level D includes:

Work uniform (disposable or reusable)
Steel-toed boots with shanks
Chemical-resistant safety glasses
Hearing protection (when appropriate)
Hard hat (when appropriate)
Leather work gloves for equipment operators (optional)

Level D protective equipment will be modified to include additional protective equipment where skin contact with contaminants is reasonably anticipated. Disposable chemical resistant clothing will be worn when sampling and entering areas with known contamination.

5.4.2 Modified Level D Protection

If the air monitoring levels specify the need, the following additional protective equipment be required, thus upgrading for respiratory and skin protection:

-Air-purifying respirator, equipped with NIOSH/MSA approved organic chemical cartridges or combination organic chemical and high efficiency particulate air (HEPA) cartridges.
-Disposable, chemical resistant one-piece suit, (i.e. Tyvek)
-Disposable, chemical-resistant gloves (inner and outer pair). At a minimum, a double-layer combination of gloves shall be used for sampling (i.e. neoprene and nitrile; butyl and enoprene, nitrile and latex).

Meeting all of these criteria permits use of Air Purifying Respirators:

- Measured air concentrations of identified substances, with adequate warning properties, are reduced by the respirator to a level at or below the substance's permissible exposure limit and the concentrations are within the service limit of the respirator cartridge.
- Atmospheric contaminant concentrations do not exceed IDLH levels, and oxygen content $\geq$ 19.5%.
- Atmospheric contaminants, liquid splashes, or other direct contact does not adversely affect the small area of skin left unprotected by chemical resistant clothing.
- Job functions are determined not to require self contained breathing apparatus.
- Continual surveillance utilizing direct-reading instruments is conducted to detect changes in air quality necessitating a higher level of respiratory protection.

5.4.3 Safety Equipment and Materials

Equipment operators from PWC shall bring the following safety equipment and materials, and have these items readily available in the support vehicle:

-First-aid kit
-Eyewash/shower
-Fire extinguisher (20 pound A,B,C-rated type)
-Shovel, Broom and plastic sheeting (6 or 10 ml)

6.0 AIR MONITORING

The safe work practices during work tasks are sufficient to protect field personnel against exposure to airborne hazardous substances. However, air monitoring to determine if flammable or explosive atmospheres are being generated, at the time of soil invasive activities, such as drilling or excavating, will be conducted. This air monitoring will help to determine appropriate levels of PPE for work tasks. If personal air samples are taken, they shall be collected in accordance with NIOSH or OSHA methods for petroleum distillates and analysis shall be conducted by the Navy Environmental Preventive Medicine Unit, Industrial Hygiene Laboratory at Naval Station, San Diego.

Workplace and personal breathing zone dust samples have been collected on other demolition and remediation projects. Total and respirable dust sample concentrations have routinely been well below the PEL of 5 mg/m^3 and heavy metal (i.e. lead, copper, nickel, ...etc) exposure limits.

6.1 Organic Vapors

Air monitoring for organic vapors has been done on several demolition and remediation jobsites. In each case, a negative exposure assessment has been obtained. Documentation of these events has been provided to the PWC Safety Department and the Navy Medical Center Industrial Hygiene Department.

Regardless, air monitoring may be done using a direct reading analyzer such as a Neotronics Exotox 40 or a Foxboro Toxic Vapor Analyzer (TVA) and may include indirect air sampling. Total organic compound concentrations will be obtained before beginning any work tasks, throughout the day, and in response to any community persons reporting unusual odors. Measurements will be taken both around the job site and in the breathing zone of personnel working in the area. All breathing zone samples with a sustained reading lasting at least 5 minutes in duration.

If TVA levels indicate sustained levels greater than 25 ppm organic vapors, indirect air monitoring shall be considered for PWC personnel. The method used shall be depend upon conditions present. If a 2 ml bulk sample is available, monitoring for petroleum distillates may be performed. If no bulk sample is available, indirect air monitoring for total hydrocarbons may be conducted.

- NIOSH Method #1550 for petroleum distillates requires a calibrated sampling pump ranging from 0.01 to 0.2 liters per minute, to collect a volume of 1.3 to 20 liters, and a 100/50 charcoal tube, with a 2 ml bulk liquid sample.

- OSHA Method #7 for total hydrocarbons using a calibrated sampling pump ranging from 0.01 to 0.2 liters per minute, to collect up to 50 liters of air on 400/200 charcoal tube, or a 3M passive dosimeter to collect up to 8 hours of area samples.

6.2 Total and Respirable Dust

Air monitoring for total and respirable dusts has been done on several demolition and remediation jobsites. In each case, a negative exposure assessment has been obtained. Documentation of these events has been provided to the PWC Safety Department and the Navy Medical Center Industrial Hygiene Department. Exposure to metals adhered onto total and respirable dusts in excess of the OSHA permissible exposure limits (PELs) is not anticipated during any field activities, however personnel air monitoring may be conducted upon request. The PEL for total dusts is 15 mg/m^3 and the PEL for respirable dusts is 5 mg/m^3. Should the results from these analyses indicate exposure at one half the PELs, subsequent air sampling will be conducted for specific metal compounds. To support the negative exposure assessment, indirect air monitoring will be conducted in accordance with NIOSH Methods described below:

- NIOSH Method #0500 for total dusts requires a calibrated sampling pump ranging from 1.5-2.0 liters per minute, to collect a total volume ranging from 25 - 133 liters, and cassette holder equipped with a matching tared 5 micron poly vinyl chloride filter.

- NIOSH Method #0600, for respirable dusts requires a calibrated sampling pump at 1.7 liters per minute, to collect a total volume ranging from 75-1,000 liters, and a cassette holder equipped with a tared 5 micron PVC filter attached to a cyclone tube.

- NIOSH Method #7300 for metals scan (including but not limited to lead, iron, chromium, zinc, arsenic, cadmium, manganese, cobalt, vanadium, copper, and nickel), using a calibrated sampling pump at 1-4 liters per minute, to collect a total volume of 400 liters, using a 0.8 mixed cellulose ester filter.

6.3 Air Monitoring Action Levels

Level D protection will be worn only when Neotronics-CGI, oxygen, and toxics readings are acceptable, or if TVA readings are less than 10 parts per million (ppm) and if dusts are present, the soils are sufficiently wetted. If dust particles cannot be suppressed or if the TVA measurement is greater than 10 ppm, air purifying respirators must be worn. If concentrations of organic vapors exceed 25 ppm supplied air respirators must be worn and if concentrations of organic vapors exceed 250 ppm, the site activities will be immediately discontinued, the personnel will be directed to evacuate the area and the project manager, along with the site supervisor will consult with the PSHM about whether or not to continue site activities. Table 6.3 summarizes the air monitoring action levels identified for this project.

Table 6.3 AIR MONITORING ACTION LEVELS

CHEMICAL	INSTRUMENT	READING	REQUIRED ACTION	MONITORING FREQUENCY
Dust Levels Total & Respirable	HazDust III Real Time Particulate Monitor	>10mg/m^3 < 3 mg/m^3	Stop Work Continue	During soil disturbance, soil excavation, loading of trucks or upon request by operators, regulators or community.
Oxygen	MSA or Quest CGI	> 19.5% < 16.5	Stop Work Continue Work	During confined space entry or tank removal projects. Ventilate or inert to prevent fires.
Combustible Vapors	MSA or Quest CGI	>10% LEL <10% LEL	Stop Work Continue Work	During confined space entry or tank removal projects. Ventilate or inert to prevent fires.
Hydrogen Sulfide	Quest CGI	> 1 ppm < 1 ppm	Stop Work Continue Work	During confined space entry or tank removal projects. Ventilate to ensure no toxics.
Organic Vapors	Foxboro TVA 1000	< 10 ppm >10 - 25 > 25 ppm > 250 ppm	Level D Modified Level D Level C Stop Work	Upon request by heavy equipment operators or community.
Radiologics	Ludlum-3 Survey Meter 44-2 probe 44-9 probe	> Bkg (cpm) >2Xs Bkg >Bkg	Take readings Secure area Secure artifact	Contact Radiation Safety Officer for guidance/directions.

6.4 *Calibration and Maintenance of Air Monitoring Survey Equipment*

The PHSO will brief all personnel using field survey equipment on its operation, limitations, and maintenance. A designated individual familiar with the devices will perform maintenance and calibration in accordance with manufacturer guidelines. Repairs, maintenance, and routine calibration of these devices will be recorded in an equipment maintenance logbook that the service technician will sign. The equipment maintenance logbook for each instrument will be kept in that instrument's case.

Air monitoring equipment will be calibrated before work begins. On-site personnel will perform only routine maintenance (such as changing batteries or lamps and cleaning lamps and fans). A trained service technician will perform any additional maintenance.

The CNRSW Safety Department Confined Space Program Assistants (CSPA) calibrate the Neotronics Exotox 40 every six months. The oxygen detector is calibrated against clean ambient atmospheric air which contains 20.9% oxygen. The hydrogen sulfide detector is calibrated using a 90-ppm in hydrogen sulfide in nitrogen gas, and the explosive detector is calibrated using 1.5-% methane in air calibration gas. Each instrument is marked with a sticker indicating the next calibration date. Bump gas is used immediately prior to field activities, to ensure proper instrument response.

The PWC C980 Industrial Hygienist maintains a Mine Safety Appliance (MSA) Model 260 Combustible Gas Indicator (CGI) and Oxygen Meter. The CGI is calibrated using 0.75% pentane in air and the unit will alarm when the 10% LEL is reached. The oxygen meter will alarm when oxygen concentrations dip below 19.5%.

The PWC C980 Industrial Hygienist also maintains a Foxboro TVA 1000, which is calibrated prior to use. The photo-ionization detector is calibrated using 100 ppm of isobutylene gas, while the flame ionization detector is calibrated using 100 ppm of methane gas. Both detectors are also calibrated to zero using a 1ppm total hydrocarbon "zero" gas. The calibration information is saved in the instrument's memory until the next calibration event. Persons performing the calibration are instructed to record the information in the logbook in the event of difficulties retrieving data from the instrument post sampling.

The instrument is programmed to record a data point every 5 seconds during fieldwork after establishing the logging time period. The data is downloaded immediately after the field activities and a hard copy of the calibration and data logged are printed for the program manager's records. Additionally, calculations are performed to establish the minimum, maximum, average, 8-hr time weighted average and short-term exposure limits (STEL) for the data logging period. The high level alarm is set for 10,000 ppm, or 1% of the lower explosive limit (LEL) for each of the calibration gases.

The PWC C980 Industrial Hygienist also maintains the HazDust III Real Time Particulate Monitor, a factory calibrated instrument. Field checking is done using an Arizona Fine Road Dust portable standard. The instrument can be programmed to log a data point every second, or integrate the data over a minute or over a ten minute interval. This data can be downloaded immediately after the field activities and a hard copy of the data can be printed for the project records. The instrument will also provide a statistical summary of the following concentrations: maximum, minimum, time-weighted-average (TWA), and short-term-exposure-limit (STEL). The instrument has three different attachments to allow for monitoring of total (inhalable) dust particles, for thoracic dust particles and for respirable dust particles. The three different dust particle sizes are measured based on a 50% collection efficiency for particles equal to 100 microns for inhalable; 10 microns for thoracic and 5 microns for respirable fractions, respectively. The HazDust III has a built in air sampling pump that allows for the simultaneous collection of a 35mm cassette that can be equipped with the appropriate filter media for the various particulate analysis, such as gravimetric determinations and metals scans.

6.5 Radiologic Survey Equipment

PWC staff will use the Ludlum 3 radiologic survey equipment in accordance with the Radiologic Contaminant Survey Program. Refer to ENV DEPT SOP 980-95-rcs. The 44-2 scintillation detector probe is primarily for X-ray and gamma ray photon detection while the 44-9 detector probe provides the ability to survey for alpha and beta-gamma activity. This instrument is maintained and calibrated by Occupational Services Inc. to ensure the equipment meets the National Bureau of Standards requirements.

7.0 TRAINING REQUIREMENTS

The OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) training requirements, as described in 29 CFR 1910.120 apply to those persons conducting field work onsite. This section states that all personnel involved with characterizing or remediating an uncontrolled hazardous waste site would be required to have 40 hours of training and three days of supervised field experience. The PWC Environmental Department requires "general site workers", those individuals performing field activities such as excavation or trenching work, to have completed the OSHA Hazardous Waste Operations Training Course (HAZWOPER), as required by the Code of Federal Regulations (CFR) 1910.120.

Personnel who are on-site occasionally and engaged in inspection and sampling activities that are unlikely to expose them over the permissible exposure limit (PEL) and published exposure limits may be considered "workers on site only occasionally for a specific limited task." These workers would need 24 hours of training and one day of actual field experience. Employees who have minimal (low risk) exposure or low probability of exposure to hazardous substances are covered by other OSHA standards, such as the Hazard Communication standard (29 CFR 1910.1200)

7.1 Preassignment Training

Prior to arrival at the job site, certification must be provided that shows field personnel meet the requirements of preassignment training. Consistent with OSHA 29 CFR 1910.120 paragraph (e)(3), each employee should be able to provide a certificate for 24 or 40 hours of training, three days of supervised on-the-job training, as well as be current in having received eight hours of annual refresher training. Before admission to the site, personnel will be required to document their fulfillment of these requirements and demonstrate their understanding of this plan by signing the Daily Site Safety Log/Compliance Agreement Form.

7.2 Supervisor Training

Consistent with OSHA 29 CFR 1910.120 paragraphs (e)(8), individuals designated as site supervisors require an additional eight hours of certified training.

7.3 CPR/First Aid Training

All PWCSD Code 980 on-site employees will be certified for CPR and or First Aid.

7.4 Training and Medical Clearance Documents

Copies of current OSHA training and medical clearance documents for PWCSD personnel are available at the PWC Environmental Department Headquarters. Upon request, copies of these documents will be provided via fax, hand-delivery, or other means.

8.0 STANDARD WORK PROCEDURES

Fieldwork activities are more specifically outlined in Work Plan. In general, fieldwork shall proceed as follows:

8.1 Area Marking

All field activities will be bounded by either cones, construction barricades and/or yellow caution tape.

8.2 Heavy Equipment Operation

Heavy equipment operation involving building demolition will be performed using in-house PWC workforces, primarily from the Transportation Department, Code 700. Only certified individuals will be allowed to work in contaminated areas, using the minimum level D personal protective equipment, with provisions to upgrade based on scheduled or random air monitoring. At a minimum, sampling personnel will wear Level D personal protective equipment and be equipped to don air purifying respirators when sustained readings equal or exceed air monitoring action levels.

8.3 Demolition Debris Recycling/Disposal

PWC Code 700 will provide the transportation as needed for the disposal or recycling of the materials as follows: concrete will go to a recycling facility in Lakeside; steel is going to on-base recycling; wood and drywall is going to Miramar Landfill. PWC C980 staff will coordinate the appointments necessary for these activities.

8.4 Site Restoration

Site restoration involves providing an asphalt cover over the surfaces. An outside contractor will perform asphalt placement activities, under the direction of C980 staff.

8.5 Safe Work Practices

Safe work practices for site activities include the following:

a) All site personnel will enter a designated exclusion zone only through the contamination reduction corridor (CRC). All personnel leaving an exclusion zone must exit through the CRC and undergo the decontamination procedures.

b) Only vehicles and equipment necessary to complete work tasks (such as drilling rigs and support trucks) will be permitted within an exclusion zone. All nonessential vehicles and equipment will remain within the support zone.

c) Containers (such as drums) will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.

d) All personnel will avoid contact with potentially contaminated substances. Walking through puddles or mud and kneeling on the ground will be avoided whenever possible.

e) Food and beverages, use of tobacco products, and application of cosmetics will not be permitted in the exclusion zone.

f) All personnel will be required to wash their hands and faces before eating, drinking, smoking, or applying cosmetics.

g) Site personnel will observe each other for signs of toxic exposure and heat or cold stress. Indications of adverse effects include but are not limited to; changes in complexion and skin discoloration; changes in coordination; changes in demeanor; excessive salivation and papillary response; and changes in speech patterns.

h) Site personnel will inform each other of nonvisual effects of illness, such as; headache, dizziness, nausea, blurred vision, cramps, and irritation of eyes, skin, or respiratory tract.

9.0 COMMUNICATION PROCEDURES

A cellular phone and or radios will be present on the site while work is in progress for the purpose of obtaining timely medical care, and additional emergency and logistical assistance.

Personnel in the Exclusion Zone should remain in regular contact (daily before and after work commences) with either the PM, PHSO or SSO. A failure of communication requires an immediate re-establishment of communication or cessation of work until communications can be reestablished.

A single 15-second long blast from an air horn or vehicle horn is the emergency signal that all personnel should leave the exclusion zone.

*The following standard hand signals will be used in case of radio communication failure:

Hand gripping throat: Out of air, can't breathe
Grip partner's wrist: Leave area immediately hands on waist
Hands on top of head: Need assistance
Thumbs up: Ok, I understand, am all right
Thumbs down: No, negative

10.0 DECONTAMINATION PROCEDURES

Equipment decontamination is not required for this project. The equipment decontamination procedures described in the following sections are based on guidelines appropriate for low-level contamination of organic or heavy metal compounds. When appropriate, Liquinox7 or Alconox7 cleaning solutions and deionized water rinses will be used to decontaminate equipment. Wastewater generated by equipment decontamination activities will be stored in 55-gallon containers or DOT approved containers. The PM will label the wastewater and will arrange for this investigation-derived waste to be transported by PWC to an authorized disposal facility.

10.1 Reusable Equipment

Reusable equipment will be decontaminated before and after each use. Distilled water will be used for the following sampling equipment decontamination procedures:

- Scrub the equipment with a brush in a bucket containing Liquinox7 or Alconox7 solution and potable, distilled water.
- Triple-rinse the equipment with distilled water, and allow it to air dry.
- Reassemble the equipment and place it in a clean area on plastic or aluminum foil. If aluminum foil is used, wrap the equipment with the dull side of the aluminum foil toward the equipment.

10.2 Personnel

Remove and bag disposable chemical-resistant gloves and clothing (i.e. Tyvek) in a plastic trash bag. If cotton coveralls are used, bag and wash prior to rewearing. Remove respirator, if worn, wash in TSP and water and rinse. Wash hands and face. Take a shower and wash hair as soon as possible after leaving the site.

10.3 Investigation-Derived Material Disposal

Investigation-derived materials are not expected to be generated on this project. Wastes which may be generated during the field work include used personal protective equipment (PPE). Where possible, these wastes will be containerized on site and stored temporarily in 5 or 55-gallon drums or other suitable containers. Disposal of these wastes will be based on analytical results of the item in question. Non-contaminated wastes will be disposed of on site as non-hazardous solid wastes. Contaminated wastes will be transported by PWC to an authorized disposal facility. The PM shall maintain copies of all turn-in documents, bill-of ladings, uniform hazardous waste manifests, or waste acceptance forms demonstrating ultimate disposal of these wastes.

11.0 UPDATES OF HEALTH AND SAFETY PLAN

Updating of this Health and Safety Plan shall be done as frequently as necessary to ensure safe work conditions. Suggestions should be brought to the attention of the PM, PHSO or Site Safety Officer. If unforeseen situations arise, this plan will be updated accordingly.

12.0 EMERGENCY RESPONSE

12.1 Physical Injury

The SSO will have initial controlling authority during an emergency. In the event of an accident resulting in physical injury, emergency service personnel will be contacted immediately. First aid will be performed immediately, commensurate with training and seriousness of the injury. Severely injured personnel are to be transported only by emergency service personnel and/or by ambulance personnel, unless a life-threatening condition is judged to exist that must be addressed immediately. If emergency or ambulance personnel transport injured personnel to the hospital, the hospital will be selected at the discretion of the emergency/ambulance personnel. The hospital selected may or may not be the hospital listed in this document.

12.2 Emergency Escape Route

Workers will evacuate the exclusion zone by the most expedient route available, preferably through the contamination reduction zone, and meet for a head count at the assemble area predetermined at the site safety meeting. In all situations when an emergency results in the evacuation of the Exclusion Zone, personnel must not re-enter until:

1. The conditions causing the emergency have been corrected.
2. The existing hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. Site personnel have been briefed on any changes to this Site Safety Plan.

12.3 Fire or Explosion

In the event of a fire or explosion at the site, the Camp Pendleton Federal Fire Department will be contacted as soon as possible and evacuation of the site will begin immediately.

12.4 Protective Equipment Failure

If any worker in the exclusion zone experiences a failure of protective equipment that affects the worker's personal protection, the worker and all coworkers will immediately leave the exclusion zone. Reentry to the exclusion zone will not be permitted until the protective equipment has been repaired or replaced and the cause of the equipment failure has been determined and is no longer considered a threat.

12.5 Spill Control and Containment Procedures.

During all site activities, nearby storm drains and catch basins will either be monitored, covered or absorbent material will be placed around the drain opening. Chemicals or hazardous substances could be spilled during site tasks as a result of a transportation accident, rupture of underground piping, decontamination of equipment, or improper handling of investigation derived waste during off-loading. The emergency plan will be activated in the event of unplanned spill of hazardous or unknown substances.

In the event of any spill at the site, the PM, PHSO and SSO will be notified immediately by whomever first witnesses the emergency event. As soon as the spill is discovered, all nonessential workers will be directed to evacuate the immediate area to reduce the likelihood of spreading contamination or being exposed to contamination. Designated emergency response personnel will proceed to the spill area with a spill cleanup and control kit, including absorbent material. Response personnel will wear the appropriate PPE. Attempts will be made to stop the source of the spill immediately. Absorbent material will be placed in the area around the release to prevent further migration.

The PHSO or SSO will use a direct reading OVA to monitor potential airborne VOC exposures during spill cleanup work. The PHSO or SSO will remain at the spill area until the area has been cleaned, inspected, and readied for reentry. In the event of a spill and incident report will be prepared and available for review.

ATTACHMENT A: SITE EMERGENCY PHONE NUMBERS

Primary Contaminants of Concern: Petroleum Hydrocarbons
Minimum Level of Protection: Level D

PWC Environmental Office Telephone: (619) 524-6924
PWC Office Mailing Address: 2730 McKean Street, Ste 1. CODE 980
San Diego, CA 92136

Mobile Phone On-Site: (619)571-4178

EMERGENCY PHONE NUMBERS:

Fire, Military Police: 9-911

Poison Control: 1-800-451-1428

National Response Center: 1-800-424-8802

MCBCP Env & Nat Res: Linda Teason
Br Head Water Quality (760) 725- 9741

MCBCP Utilities Liaison: John Whiteside
Or Ernie Grant (760) 725-3538

MCB Safety & Security Office, Bldg 2622,
Mishaps, & Accidents (760) 725-3672

PWC Code 980 Contacts:
Division Director: Rod Soule
(619) 524-6778
Project Manager: Karen Collins
(619) 524-0515
Cell Phone (619) 571-4020

Project H&S Officer: Craig Haverstick
(619) 524-6978
PWC Duty Desk: (619) 556-4176

MEDICAL FACILITIES: 41

Civil Service: For Non-Life Threatening Injuries and Incidents:
Medical Clinic: Area ~~13~~, ABMC, Bldg 13129 (760) 725-6682

Civil Service For Serious Injuries and Incidents:
Naval Hospital: Area 26/27, Building H-100, OHU 5th Floor North (760) 725-1026
Navy Hospital: Navy Medical Center 34800 Bob Wilson Drive; (619) 532-8276

CONTRACTORS: ***(including Thomas Brothers 1997 map page and grid coordinates)***

Sharp Urgent Care	130 Cedar Rd @ Emerald, Vista	(760) 806-5400 [TB pg.1087 C-7]
TriCity Medical Center	4002 Vista Way, Oceanside	(760) 724-8411 [TB pg. 1107 B-2]
Scripps Hospital	354 Santa Fe Drive, Encinitas	(760) 753-6501 [TB pg. 1167 D-1]

FIRST AID FOR PETROLEUM HYDROCARBON EMERGENCIES

Ingestion:	DO NOT INDUCE VOMITING. Call Poison Control; follow instructions. Administer CPR, if necessary. Seek medical attention.
Inhalation:	Remove person from contaminated environment. DO NOT ENTER A CONFINED SPACE TO RESCUE SOMEONE WHO HAS BEEN OVERCOME UNLESS PROPERLY EQUIPPED AND A STANDBY PERSON IS PRESENT. Administer CPR if necessary. Seek medical attention.
Skin Contact:	Brush off dry material, remove wet or contaminated clothing. Immediately wash with soap, flush skin thoroughly with water. Seek medical attention if irritation persists.
Eye Contact:	Flush eyes with water for 15 minutes. Seek medication attention.
Exposure Symptoms:	Petroleum Hydrocarbons: Headache, dizziness, nausea, drowsiness, irritation or eyes, nose, throat, breathing difficulties. TCE: Headache, vertigo; visual disturbance; tremors; somnolence; nausea; vomiting; eye irritant; dermatitis; cardiac arrhythmia; paresthesia;

Contingency Plan: Report incident to Project Manager, Site Health and Safety Officer, or Health and Safety Manger after emergency procedures have been implemented.

EMERGENCY MEETING LOCATION

Parking lot of bldg 41359 or location set at daily tailgate safety meeting.

ATTACHMENT B: MEDICAL CLINIC & HOSPITAL ADDRESS AND ROUTE

Camp Pendleton Hospital:

Area 26/27, Building H-100, OHU 5th Floor North *(760) 725-1026*
Proceed from worksite to Stuart Mesa Road. Follow Stuart Mesa Road south to Vandergrift Road. Take Vandergrift east to Santa Margarita Road, you will be traveling to the Fallbrook side of Camp Pendleton. Santa Margarita Road will lead you to the entrance of the base hospital.

Navy Medical Center/Balboa Naval Hospital
34800 Bob Wilson Drive, San Diego, Ca (619) 532-8276

Leave the base via the Las Pulgas gate located at the northern portion of Stuart Mesa Road. Follow signs leading to south interstate 5 freeway. Drive south on interstate 5 to San Diego, exit on Pershing Drive. At first stoplight, take left onto Florida Drive; at next stoplight take left onto Florida Place. Follow signs that lead to Emergency Room (Building 1).

Area 13 Branch Medical Clinic:

Medical Clinic: *Area 13, ABMC, Bldg 13129* *(760) 725-6682*

Leave work site and proceed to Vandergrift Road via Stuart Mesa Road. Take Vandergrift east to South Rattlesnake Road. Take South Rattlesnake Road to Vandergrift Road, south on Vandergrift Road to 15th street. The entrance to the medical clinic is west of 15th street.

Offsite Civilian Emergency Hospital and Urgent Care:

TriCity Medical Center	*4002 Vista Way, Oceanside*	*(760) 724-8411*
Sharp Urgent Care	*130 Cedar Rd @ Emerald, Vista*	*(760) 806-5400*

Note; Tri-City and Sharp are located within ½ mile of each other. Leave the base via the main gate located at the southern portion of Vandergrift Blvd (Oceanside gate). Follow signs leading to south interstate 5 freeway. On the 5 Freeway take the Hiway 78 east exit. Travel east on 78 and take the College Blvd exit, go north across the freeway, turn right on Vista Way. Tri-City Medical Center is on the north side of Vista Way.

Sharp Urgent Care is located within ½ mile of Tri-City Medical Center. Directions for Sharp Urgent Care are the same as above, drive past Tri-City Medical Center 2 blocks to Cedar Rd. Cedar Rd will be on the north side of Vista Way. Turn left on Cedar Rd, Sharp Urgent Care will be on the west side of Cedar Rd.

Scripps Hospital

354 Santa Fe Drive, Encinitas *(760) 753-6501*

Leave the base via the main gate located at the southern portion of Vandergrift Blvd (Oceanside gate). Follow signs leading to south interstate 5 freeway. On the 5 freeway take Santa Fe Drive exit located in Encinitas. Upon exiting the freeway travel west on Santa Fe Drive, Scripps Hospital will be located on the north side of Santa Fe Drive approximately ½ mile from interstate 5 freeway.

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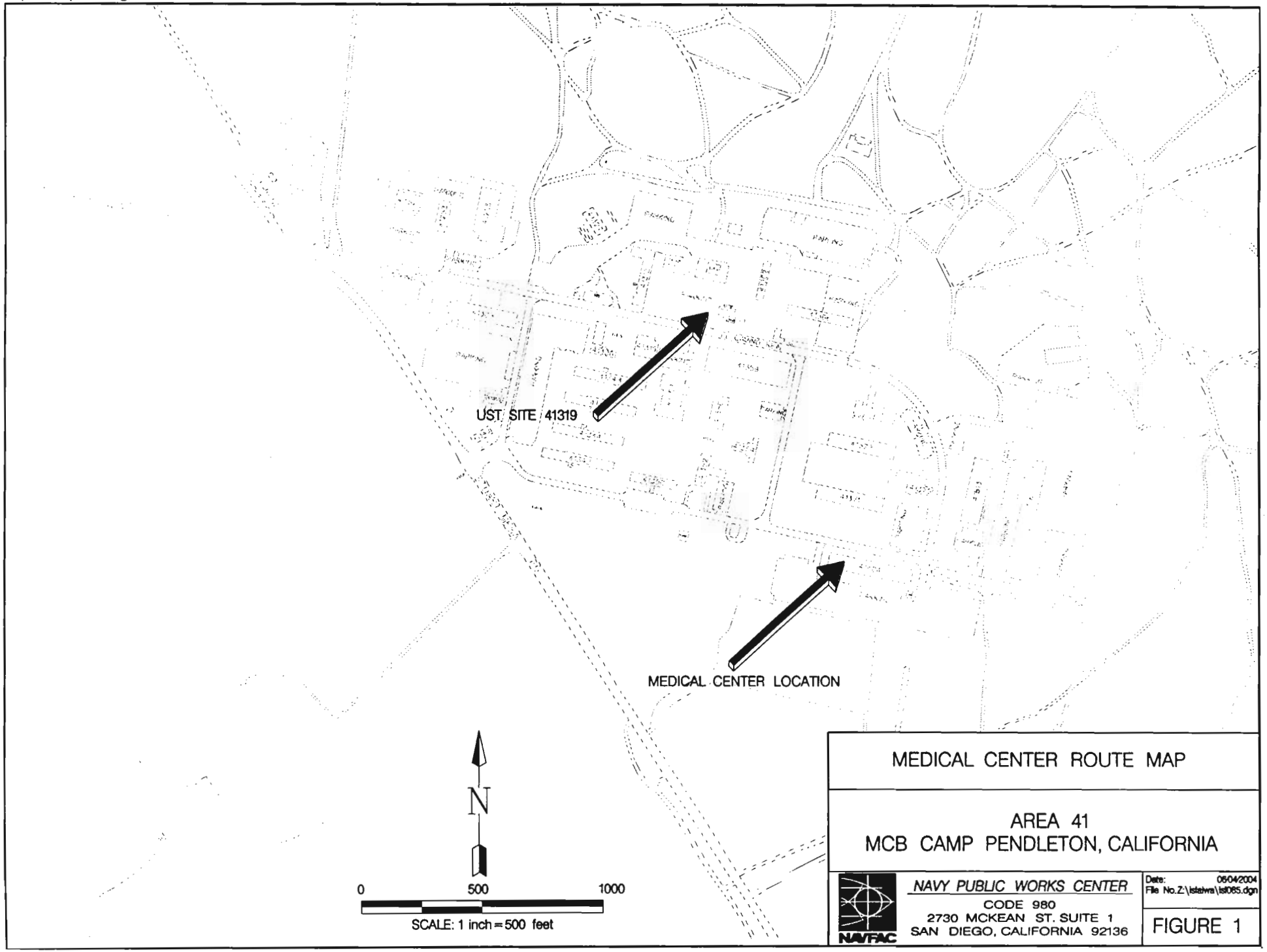


MEDICAL CENTER ROUTE MAP

AREA 41
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 06/04/2004
File No.Z:\islaiwa\isl085.dgn

FIGURE 1

ATTACHMENT C: INSPECTION, PERMITS & REPORTING FORMS

- WASTE ACCEPTANCE FORM
- DAILY EXCAVATION/TRENCHING INSPECTION FORM
- CONFINED SPACE ENTRY PERMIT FORM
- HOT WORK PERMIT FORM
- MEDICAL DISPENSARY FORM
- TELEPHONE REPORT OF MISHAP (ACCIDENT/INJURY)
- SUPERVISORS REPORT OF MISHAP AND INVESTIGATION FORM
- SPILL REPORTING FORM

ENVIRONMENTAL DEPARTMENT TREATMENT FACILITIES
NAVY PUBLIC WORKS CENTER, SAN DIEGO

WASTE ACCEPTANCE FORM

BULK CONTROL NO: _____ /_____/_____

CUSTOMER USE ONLY:

TRACK NO: _____-_____ DATE: ___/___/_____ TIME: _____

ACTIVITY NAME:_____ BASE: _____

BUILDING / LOCATION: _____ PHONE NUMBER:_____

JOB ORDER NUMBER: _____ UIC:_____

WASTE DESCRIPTION: _____

_____

NAD USE ONLY

BOWSER ID: _____ TANK NO: _____ SHOP NO:_____

PROCESS GENERATING WASTE: _____

SOURCE CODE: _____ FORM CODE: _____

APPLICABLE WASTE CODES: NONHAZARDOUS: _____ EPA: _____ CALIFORNIA: _____

CONTAMINANTS AND CONCENTRATIONS (MG/L) :_____

WASTE PROFILE NUMBER: _____VOLUME (GALLONS): _____ LIQUID LEAVEL_____

CODE 932 USE ONLY:

FACILITY: IWTP_____ NI OWTP_____ NS#1 OWTP_____ NS#2 OWTP_____ SUBASE OWTP _____ NAB OWTP _____

Manifest#: _____ EPAGENID: _____ NON_HAZ _____ RECYCLE_____

TIME ARRIVED: _____PUMP START TIME: _____ PUMP END TIME: _____

PHYSICAL STATE: _____ SLUDGE IN BOWSER: YES ____ NO ____VOLUME (GALLONS):_____

FIELD TEST RESULTS (MG/L):

Cr. (VI) _____ CLOR-D-TECT _____ OTHER _____

Total Cr _____ HYDROCLOR-Q _____ _____

CN _____ _____

PH: _____ TREATMENT GROUP: 1 – OW ____ 2-CONTAMINATED OW/GIW_____
3 – CHROME _____ 4 – MIXED METALS _____ TRACKING NUMBER:____-___-____-_____.
5 - CYANIDE _____ 6– PHENOL _____ 7 – SPECIAL ____

TREATMENT TANK: _____ BATCH NUMBER: _____

TREATMENT CODES (CHECK ALL APPLICABLE):

T22-CHEMICAL OXIDATION ____ T23- CHEMICAL PRECIPITATION ____ T24- CHEMICAL REDUCTION ____ T27-CYANIDE DESTRUCTN____
T31- NEUTRURLAIZATION _____ T38- DECANTING _____ T42- FLOTATION _____ T44 - SEDIMENTATION _____

ACTIVITY REP RESENTATIVE _____ _____
NAME SIGNATURE AND DATE

CODE 920 REPRESENTATIVE _____ _____
NAME SINGATURE AND DATE

Prepaired by Jerry C. 03/30/00

Waste Acceptance Form must accompany all wastewater shipments sent to the Navy Public Works Center (PWC) Industrial waste Treatment Plant or Oily Wast Treatment Plant. Instructions on how to complete the top, customer portion of the form follow:

BULK CONTROL NO: will be assigned by plant personnel.

TRACK NO: Enter number assigned by the PWC Environmental Department Hazardous Waste Scheduler for bulk pumping shipments. If the waste shipment was cheduled through the PWC Hazardous Waste Scheduler. Leave blank.

Ξ Date of the waste shipment.

TIME Time that vehicle departed generator site.

ACTIVITY NAME. Enter activity name. eg. PWC Code 700

BASE Base where waste was generated. E.g. Miramar.

PHONE NUMBER Phone number for activity representative.

JOB ORDER NUMBER. Waste disposal billing Job Order Number.

The fields below are to be used to describe the waste shipment.

WASTE DESCRIPTION. In this field write a brief, specific description of the waste such as Chrome Plating Rinse Tank Water.

NADEP USE ONLY. Only NAD will fill in this section.

SOURCE CODE. Select the appropriate source code to describe the waste generating process from the list below. In no applicable code is listed below please refer to the EPA Biennial Report instructions for a complete list of form and source codes.

FORM CODE. Select the appropriate form code to describe the waste from the list below.

APPLICABLE WASTE CODES. Applicable federal Environmental Protection Agency (EPA) or California State waste codes. If the waste is not a hazardous waste.
enter nonhazardous.

WASTE CONTAMINANTS AND CONCENTRATIONS (MG/L). Enter the concentrations of known waste contaminants, eg. 25 mg/l chromium. **(NAD EXEMPT FROM THIS)**

WASTE PROFILE NUMBER. If available enter customer assigned Waste Profile Number.

VOLUME (GALLONS). Total volume in gallons of the waste shipment.

SOURCE CODES

CLEANING AND DEGREASING

A01 STRIPPING
A02 ACID CLEANING
A03 CAUSTIC-ALKALI-CLEANING
A04 FLUSH RINSING
A05 DIP RINSING
A06 SPRAY RINSING
A09 CLEAN OUT PROCESS EQUIPMENT
A19 OTHER CLEANING DEGREASING

SURFACE PREPARATION
A21 PAINTING
A22 ELECTROPLATING
A23 ELECTROLESS PLATING
A24 PHOSPHATING
A26 PICKLING
A27 ETCHING
A29 OTHER SUFRACE PREPARATION

PROCESSES OTHER THAN SURFACE PREPARATION
A31 PRODUCT RINSING
A32 PRODUCT FILTERING
A37 SPENT PROCESS LIQUIDS REMOVAL

PRODUCTION OR SERVICE DERIVED ONE TIME AND INTERMITTENT PROCESSES
A51 LEAK COLLECTION
A54 OIL CHANGES
A57 DISCARDING OFF-SPEC MATERIAL
A58 DISCARDING OUT-OF-DATE PRODUCTS OR CHEMICALS
A59 OTHER PRODUCTION-DERIVED ONE TIME AND INTERMITTENT PROCESSES

REMEDIATION DERIVED WASTE
A61 SUPERFUND REMEDIAL ACTION
A62 SUPERFUND EMERGENCY RESPONSE
A63 RCRA CORRECTIVE ACTION AT SOLID WASTE MANAGEMENT UNIT
A64 RCRA CLOSURE OF HAZARDOUS WASTE MANAGEMENT UNIT
A65 UNDERGROUND STORAGE TANK CLEANUP
A69 OTHER REMEDIATION

OTHER PROCESSES
A94 LABORATORY WASTES
A99 OTHER

FORM CODES

INORGANIC LIQUIDS

B101 AQUEOUS WASTE WITH LOW SOLVENTS
B102 AQUEOUS WASTE WITH LOW OTHER TOXIC ORGANICS
B103 SPENT ACID WITH METALS
B104 SPENT ACID WITHOUT METALS
B105 ACIDIC AQUEOUS WASTE
B106 CAUSTIC AQUEOUS SOLUTION WITH METALS BUT NO CYANIDES
B107 CAUSTIC SOLUTION WITH METALS AND CYANIDES
B108 CAUSTIC SOLUTION WITH CYANIDES BUT NO METALS
B109 SPENT CAUSTIC
B110 CAUSTIC AUQEOUS WASTE
B111 AQUEOUS WASTE WITH REACTIVE SULFIDES
B113 OTHER AQUEOUS WASTE WITH HIGH DISSOLVED SOLIDS
B114 OTHER AQUEOUS WASTE WITH LOW DISSOLVED SOLIDS
B115 SCRUBBER WATER
B117 WASTE LIQUID MERCURY

ORGANIC LIQUIDS

B201 CONCENTRATED SOLVENT-WATER SOLUTION
B202 HALOGENATED SOLVENT
B203 NONHALOGENATED SOLVENT
B204 HALOGENATED/NONHALOGENATED SOLVENT MIXTURE
B205 OIL-WATER EMULSION OR MIXTURE
B206 WASTE OIL
B207 CONCENTRATED AQUEOUS SOLUTION OF OTHER ORGANICS
B208 CONCENTRATED PHENOLICS

INORGANIC SOLIDS

B305 "DRY" LIME OR METAL HYDROXIDE SOLIDS CHEMICALLY FIXED
B306 "DRY" LIME OR METAL HYDROXIDE SOLIDS NOT "FIXED"
B312 METAL-CYANIDE SALTS/CHEMICALS
B313 REACTIVE CYANIDE SALTS/CHEMICALS
B314 REACTIVE SULFIDE SALTS/CHEMICALS
B315 OTHER REACTIVE SALTS/CHEMICALS
B316 OTHER METAL SALTS/CHEMICALS

The bottom of the form must be signed and dated by a representative of the generating activity.
If you have any questions about how to complete the Waste Acceptance Form, please contact the PWC Hazardous Waste Scheduler at 55-8002.

TRENCH SAFETY DAILY/INCIDENT INSPECTION REPORT

Date: _____

Project location: _____

Project Supervisor: _____

Weather conditions: _____

1. All open trench was inspected _____ Y N
2. Spoil pile was located the proper distance from the trench _____ Y N
3. Were any tension cracks observed along the top of the trench _____ Y N
4. If sloped or benched, are the face angles correct _ Y N
5. Was any water seepage noted in trench walls or trench bottom _____ Y N
6. Was support system installed as designed and certified where required _____ Y N
7. Was there any evidence of caving of sloughing of soil since the last inspection _____ Y N
8. Traffic in the area adequately away from trenching operations, with barricades as needed _____ Y N
9. Trees, boulders, or other hazards in the area ____ Y N
10. Vibrations from equipment or traffic too close to trenching operations _____ Y N
11. List heavy equipment in use or in the near vicinity
    _____
    _____
12. Observations/Comments: _____
    _____
    _____
    _____

Name (Print) _____ Signature _____
COMPETENT PERSON

COMMANDER NAVY REGION SOUTHWEST OSH OFFICE

CONFINED SPACE ENTRY PERMIT

☐ PERMIT REQUIRED CONFINED SPACE (FOR CSPM/ACSPM ONLY) ☐ NON-PERMIT REQUIRED CONFINED SPACE (FOR QUALIFIED PERSONS ONLY) ☐ NON-ENTRY PERMIT

ID NUMBER:	DESCRIPTION:	LOCATION:	BASE:	COMMAND/CODE:

PURPOSE OF ENTRY

☐ HOT-WORK ☐ MAINTENANCE ☐ INSPECTION ☐ OTHERS:

ENTRY PERMIT NOT VALID FOR CONTRACTORS

AUTHORIZED ENTRANTS

AUTHORIZED ATTENDANTS:

ATMOSPHERIC TEST DATA

		PRE-ENTRY						FOLLOW-UP			
1ST Test		Issued Time	Issued Date	Expires Time	Expires Date	2ND test		Issued Time	Issued Date	Expires Time	Expires Date
	Oxygen Level						Oxygen Level				
	Explosive Level						Explosive Level				
	Hydrogen Sulfide						Hydrogen Sulfide				
	Carbon Monoxide						Carbon Monoxide				

Instrument: Model: Serial Number: Calibration Date:

REQUIRED SAFETY PRECAUTIONS

☐ Two Man Rule		Lockout-Tagout-Try Out		Fire Extinguisher:	
Ventilation: Natural ☐ Force ☐ Exhaust		Secure Area: ☐ Roped ☐ Fenced ☐ Barricade ☐ Coned		Noise Protection ☐ Ear-plugs ☐ Muffs ☐ Double Protection	
spiratory Protection: ☐ Air Purifying Respirator ☐ Air Supplied Respirator ☐ SCBA		Lighting (Explosive Proof)		Face Protection ☐ Safety glasses ☐ Face Shield ☐ Goggles	
		Ground Fault Circuit Interrupter		Head Protection ☐ Hard Hat	
Rescue Equipment: ☐ Tripod ☐ Safety Harness ☐ Lifelines		Communications Practices ☐ Voice ☐ Visual ☐ Radio		Protective Clothing: ☐ Coveralls ☐ Tyvek ☐ Welders Jacket	
Foot Protection: ☐ Rubber Boots ☐ Safety Shoes ☐ Electrical Safety Boots		Burn Permit		Material Safety Data Sheets (MSDS)	

ADDITIONAL COMMENTS:

CONFINED SPACE ASSESSMENT

	NOT SAFE FOR PERSONNEL-NOT SAFE FOR HOT WORK (CONTACT CSPM/ACSPM)
	SAFE FOR PERSONNEL-NOT SAFE FOR HOT WORK
	SAFE FOR PERSONNEL-SAFE FOR HOT WORK

If the conditions or procedures specified in the permit have change, Stop Work Immediately **Evacuate Confined Space** and notify **CSPM/ACSPM.**

I have reviewed the work authorized by this permit and the information contained herein. Written instructions and procedures for entrants, attendants and operation entry supervisor have been received and understood. This permit is not valid unless all the safety recommendations are in compliance.

OPERATION-ENTRY SUPERVISOR: (Signature)	COMMAND-CODE:	PHONE:
CSPM-ASCPM-QP (Signature)	COMMAND-CODE	PHONE:

IN THE EVENT OF EMERGENCY Call 9-911

FEDERAL FIRE DEPARTMENT

FIRE INSPECTION OF HAZARDOUS WORK (PERMIT)

Business Phone: _____
Emergency Phone Number: _____

Building Number	**Location of Work**
Work to be Accomplished	**Permit Expires** **Date:** **Time:**
Signature (Inspector)	**Issued** **Date:** **Time:**

YES	NO	PRECAUTIONS	YES	NO	WALLS OR CEILING
		Sprinkler system in service			Construction, Non-combustible
		Fire extinguisher at job site			Combustibles removed from opposite side wall/ceiling
		AREA WITHIN 35 FEET OF WORK			FIRE WATCH
		Housekeeping practices observed			To be provided during and 30 minutes after completion
		Combustible floors shielded			Supplied with portable fire extinguisher
		Combustible materials and/or flammable liquids removed			Fire Watch is aware of the closest fire alarm auxiliary pull station location
		Combustibles protected and/or shielded			

ATTENTION: BEFORE ANY HAZARDOUS WORK IS PERFORMED, THE WELDER OR JOB SUPERVISOR SHALL INSPECT THE WORK AREA AND CONFIRM THAT PRECAUTIONS HAVE BEEN TAKEN TO PREVENT FIRES IN ACCORDANCE WITH NFPA 51 (Cutting & Welding Processes).

CONTINUE TO PERFORM HAZARDOUS WORK ONLY AS LONG AS CONDITIONS ARE UNCHANGED FROM THOSE ESTABLISHED AT THE TIME THE PERMIT WAS ISSUED.

SPECIAL REQUIREMENTS (PLEASE PRINT): _____

SIGNATURE (Safety Officer If Applicable) **Date:**

SIGNATURE (Welder or Job Supervisor) **Date:**

FFDSD 11320.56 (Rev 05-95)

NAVY REGION SOUTHWEST DISPENSARY PERMIT
CNREGSW 5100/9 (12-98)

PART I (To be completed by immediate supervisor)

DATE OF REFERRAL	NAME OF EMPLOYEE BEING REFERRED	SSN	CODE

OCCUPATION OF EMPLOYEE	GRADE	PRINTED NAME AND TELEPHONE NUMBER OF SUPERVISOR

REASON FOR REFERRAL (Check one block and describe injury, illness or other)

☐ ON THE JOB INJURY _____

☐ OCCUPATIONAL ILLNESS _____

☐ OTHER _____

DATE AND TIME OF INJURY	TIME EMPLOYEE LEFT WORK	TIME EMPLOYEE RETURNED TO JOB

IMMEDIATE SUPERVISOR (Signature)	EMPLOYEE (Signature)

PART II (To be completed by Medical Officer)

TIME EMPLOYEE REPORTED	TIME EMPLOYEE RELEASED

DISPOSITION (CHECK ONE)

☐ RETURN TO FULL DUTY ☐ SEND HOME

☐ PLACE ON LIGHT DUTY FOR A PERIOD OF _____

☐ REFERRED TO PRIVATE PHYSICAN ☐ OTHER (SPECIFY) _____

RESTRICTIONS

☐ NO WORK AROUND HAZARDOUS MACHINERY ☐ NO DRIVING

☐ NO KNEELING OR SQUATTING (CIRCLE ONE) 10 20 30 40 50 PERCENT OF TIME

☐ MUST SIT _____ PERCENT OF TIME ☐ NO WORK IN EXCESSIVE NOISE AREAS

☐ NO PROLONGED WALKING, BENDING OR STANDING ☐ NO LIFTING IN EXCESS OF _____ POUNDS

☐ NO CLIMBING ABOVE _____ FEET OR STAIRS OVER _____ FEET

☐ MUST AVOID DUSTS, FUMES, SKIN IRRITATIONS OR SENSITIZERS

☐ OTHER _____

RETURN FOR FURTHER TREATMENT

☐ YES ☐ NO (IF YES, SPECIFY DATE EMPLOYEE SHOULD RETURN) _____

MEDICAL OFFICER (Signature)

TELEPHONE REPORT OF MISHAP

ATE OF REPORT:_____ TIME OF REPORT: _____ DATE OF INJURY/MISHAP:_____

_____ YES:___ NO:___ _____ _____

Person Reporting (Name) Supervisor Phone # Command

NAME OF INJURED:_____SSN:_____ UIC:_____

CIVILIAN:___ MILITARY:___ SEX:___ RANK/RATE/GRADE:_____ AGE:_____

JOB TITLE:_____ W/C:_____

WORK SHIFT: DAY:_____ SWING:_____ NIGHT:_____ WORK HOURS:_____

TYPE OF MISHAP: PERSONAL INJURY:_____ PROPERTY DAMAGE:_____ MOTORCYCLE:_____

PRIVATE VEHICLE:_____ GOVERNMENT VEHICLE:_____

TIME OF MISHAP:_____ DAY OF MISHAP:_____(Mon, Tue, Wed, etc.)

LOCATION OF MISHAP: ON BASE:_____ OFF BASE:_____ BLDG #:_____ W/C:_____

DRIVER(S) OF MOTOR VEHICLE(S):_____

ON DUTY:____ OFF DUTY:_____ RECORDED WITH BASE DISPENSARY: YES____ NO____

MEDICAL TREATMENT: YES:____ NO:____ DATE:_____ WHERE:_____

OST TIME EXPECTED: YES:____ NO:___ #DAYS:____ SICK IN QUARTERS # DAYS:____
(Military Only)

LIGHT DUTY ASSIGNMENTS: YES:___ NO:____ #DAYS:_____

HOSPITALIZATION REQUIRED: YES:____ NO:____ #DAYS:____

HOSPITAL'S NAME:_____ TELEPHONE:_____ADDRESS:_____

RETURN VISIT: YES:_____ NO:____ WHERE:_____

NATURE OF INJURY/PROPERTY DAMAGE:_____

_____

_____

COMMENTS/CORRECTIVE ACTION:_____

_____

_____

REPORT RECEIVED BY:_____
NAVOSH Representative

Revised 9/98

References: OPNAVINST 5100.23, OPNAVINST 5102.1

ilian employees: Must report all on duty mishaps immediately to their supervisor. This includes injuries, property damage, and motor vehicle. Report all traffic incidents involving government vehicles and private vehicles used during official business with or without injuries. Report all mishaps where there is damage to government equipment or property. Report all near mishaps.

Military personnel: Must report all on duty mishaps immediately to their supervisor. Must report all off duty injuries immediately upon reporting for duty. Report all traffic incidents involving government vehicles and private vehicles used during official business with or without injuries. Report all mishaps where there is damage to government equipment or property. Report all near mishaps.

Supervisors: Must report the above mishaps to the Navy Region Southwest NAVOSH Department (ext 5-1055) within 24 hours not including weekends and holidays. Deaths or incidents that cause 3 or more personnel to be hospitalized are to be reported immediately. Any supplemental documents may be submitted later. Supervisors must keep the Navy Region Southwest NAVOSH Department informed on the status of personnel who are unable to work. Immediately notify NAVOSH when injured personnel have missed 5 days of work due to the injury. The days do not have to be consecutive.

Seriously injured personnel will be transported by ambulance for emergency treatment.

Less than serious:

Military personnel will report to the Acute Care Area at the branch medical clinic for treatment.

Supervisors of civilian personnel will complete a Dispensary Permit properly and send the civilian to the Occupational Health Unit at the branch medical clinic. Civilians may be treated there or ask to see their private physician. Most private health insurance providers require their members to use the occupational health providers associated with the insurance company. When civilians covered under FECA return to work they are required to return back to the branch medical clinic for administrative purposes with a Dispensary Permit from the supervisor.

Supervisors will assist personnel in filling out the appropriate compensation forms at the employee's request.

Appropriated fund:

CA-1 Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation

CA-2 Notice of Occupational Disease and Claim for Compensation

CA-2a Federal Employee's Notice of Recurrence of Disability and Claim for Continuation of Pay/Compensation

CA-7 Claim for Compensation On Account of Traumatic Injury or Occupational Disease

CA-8 Claim for Continuing Compensation on Account of Disability

Non Appropriated fund:

LS-202 Employer's First Report of Injury or Occupational Illness

If no compensation is desired and the employee does not wish to file a compensation form then he or she does not have to file.

If there are any questions please contact Navy Region Southwest NAVOSH at 5-1055.

MOTOR VEHICLE ACCIDENT REPORT

Please read the Privacy Act Statement on Page 3.

INSTRUCTIONS: Sections I thru IX are filled out by the vehicle operator. Section X, Items 72 thru 82c are filled out by the operator's supervisor. Sections XI thru XIII are filled out by an accident investigator for bodily injury, fatality, and/or damage exceeding $500.

SECTION I - FEDERAL VEHICLE DATA

1. DRIVER'S NAME *(Last, first, middle)*	2. DRIVER'S LICENSE NO./STATE/LIMITATIONS	3. DATE OF ACCIDENT

4a. DEPARTMENT/FEDERAL AGENCY PERMANENT OFFICE ADDRESS	4b. WORK TELEPHONE NUMBER
	( )

5. TAG OR IDENTIFICATION NUMBER	6. EST. REPAIR COST	7. YEAR OF VEHICLE	8. MAKE	9. MODEL	10. SEAT BELTS USED
	$				☐ YES ☐ NO

11. DESCRIBE VEHICLE DAMAGE	

SECTION II - OTHER VEHICLE DATA *(Use Section VIII if additional space is needed.)*

12. DRIVER'S NAME *(Last, first, middle)*	13. DRIVER'S LICENSE NUMBER/STATE/LIMITATIONS

14a. DRIVER'S WORK ADDRESS	14b. WORK TELEPHONE NUMBER
	( )
15a. DRIVER'S HOME ADDRESS	**15b. HOME TELEPHONE NUMBER**
	( )
16. DESCRIBE VEHICLE DAMAGE	**17. ESTIMATED REPAIR COST**
	$

18. YEAR OF VEHICLE	19. MAKE OF VEHICLE	20. MODEL OF VEHICLE	21. TAG NUMBER AND STATE

22a. DRIVER'S INSURANCE COMPANY NAME AND ADDRESS	22b. POLICY NUMBER
	22c. TELEPHONE NUMBER ( )

23. VEHICLE IS	24a. OWNER'S NAME(S) *(Last, first, middle)*	24b. TELEPHONE NUMBER
☐ CO-OWNED ☐ RENTAL ☐ LEASED ☐ PRIVATELY OWNED		( )

25. OWNER'S ADDRESS(ES)

SECTION III - KILLED OR INJURED *(Use Section VIII if additional space is needed.)*

A

26. NAME *(Last, first, middle)*	27. SEX	28. DATE OF BIRTH

29. ADDRESS

30. MARK "X" IN TWO APPROPRIATE BOXES	31. IN WHICH VEHICLE	32. LOCATION IN VEHICLE	33. FIRST AID GIVEN BY
☐ KILLED ☐ DRIVER ☐ PASSENGER ☐ INJURED ☐ HELPER ☐ PEDESTRIAN	☐ FED ☐ OTHER (2)		

34. TRANSPORTED BY	35. TRANSPORTED TO

B

36. NAME *(Last, first, middle)*	37. SEX	38. DATE OF BIRTH

39. ADDRESS

40. MARK "X" IN TWO APPROPRIATE BOXES	41. IN WHICH VEHICLE	42. LOCATION IN VEHICLE	43. FIRST AID GIVEN BY
☐ KILLED ☐ DRIVER ☐ PASSENGER ☐ INJURED ☐ HELPER ☐ PEDESTRIAN	☐ FED ☐ OTHER (2)		

44. TRANSPORTED BY	45. TRANSPORTED TO

46. Pedestrian

a. NAME OF STREET OR HIGHWAY	b. DIRECTION OF PEDESTRIAN *(SW corner to NE corner, etc.)*	
	FROM	TO

c. DESCRIBE WHAT PEDESTRIAN WAS DOING AT TIME OF ACCIDENT *(Crossing intersection with signal, against signal, diagonally; in roadway playing, walking, hitchhiking, etc.)*

SECTION IV - ACCIDENT TIME AND LOCATION *(Use Section VIII if additional space is needed.)*

47. DATE OF ACCIDENT	48. PLACE OF ACCIDENT *(Street address, city, state, ZIP Code; Nearest landmark; Distance nearest intersection; Kind of locality (industrial, business, residential, open country, etc.); Road description).*
49. TIME OF ACCIDENT AM PM	

50. INDICATE ON THIS DIAGRAM HOW THE ACCIDENT HAPPENED

Use one of these outlines to sketch the scene. Write in street or highway names or numbers.

a. Number Federal vehicle as 1, other vehicle as 2, additional vehicle as 3 and show direction of travel with arrow.

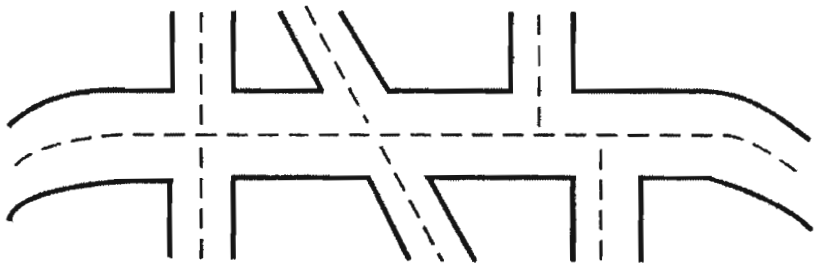
Example: → [1] [2] ←

b. Use solid line to show path before accident → [2] and broken line after the accident - - - - - - - - - - - - [2]

c. Show pedestrian by → ○

d. Show railroad by +++++++++++

e. Place arrow in this circle to indicate *NORTH*



51. POINT OF IMPACT *(Check one for each vehicle)*

FED	2	AREA
		a. FRONT
		b. R. FRONT
		c. L. FRONT
		d. REAR
		e. R. REAR
		f. L. REAR
		g. R. SIDE
		h. L. SIDE

52. DESCRIBE WHAT HAPPENED *(Refer to vehicles as "Fed", "2", "3", etc. Please include information on posted speed limit, approximate speed of the vehicles, road conditions, weather conditions, driver visibility, condition of accident vehicles, traffic controls (warning light, stop signal, etc.) condition of light (daylight, dusk, night, dawn, artificial light, etc.), and driver actions (making U-turn, passing, stopped in traffic, etc.).*

SECTION V - WITNESS/PASSENGER *(Witness must fill out SF 94, Statement of Witness) (Continue in Section VIII.)*

A	53. NAME *(Last, first, middle)*	54. WORK TELEPHONE NUMBER ( )	55. HOME TELEPHONE NUMBER ( )
	56. BUSINESS ADDRESS	57. HOME ADDRESS	
B	58. NAME *(Last, first, middle)*	59. WORK TELEPHONE NUMBER ( )	60. HOME TELEPHONE NUMBER ( )
	61. BUSINESS ADDRESS	62. HOME ADDRESS	

SECTION VI - PROPERTY DAMAGE *(Use Section VIII if additional space is needed.)*

63a. NAME OF OWNER	63b. OFFICE TELEPHONE NUMBER ( )	63c. HOME TELEPHONE NUMBER ( )
63d. BUSINESS ADDRESS	63e. HOME ADDRESS	
64a. NAME OF INSURANCE COMPANY	64b. TELEPHONE NUMBER ( )	64c. POLICY NUMBER
65. ITEM DAMAGED	66. LOCATION OF DAMAGED ITEM	67. ESTIMATED COST $

SECTION VII - POLICE INFORMATION

68a. NAME OF POLICE OFFICER	68b. BADGE NUMBER	68c. TELEPHONE NUMBER ( )
69 CINCT OR HEADQUARTERS	70a. PERSON CHARGED WITH ACCIDENT	70b. VIOLATION(S)

SECTION VIII - EXTRA DETAILS

SPACE FOR DETAILED ANSWERS. INDICATE SECTION AND ITEM NUMBER FOR EACH ANSWER. IF MORE SPACE IS NEEDED, CONTINUE ITEMS ON PLAIN BOND PAPER.

SECTION IX - FEDERAL DRIVER CERTIFICATION

In compliance with the Privacy Act of 1974, solicitation of the information requested on this form is authorized by Title 40 U.S.C. Section 491. Disclosure of the information by a Federal employee is mandatory as the first step in the Government's investigation of a motor vehicle accident. The principal purposes for using this information is to provide necessary data for legal counsel in legal actions resulting from the accident and to provide accident information/statistics in analyzing accident causes and developing methods of reducing accidents. Routine use of information may be by Federal, State or local governments, or agencies, when relevant to civil, criminal, or regulatory investigations or prosecutions. An employee of a Federal agency who fails to report accurately a motor vehicle accident involving a Federal vehicle or who refuses to cooperate in the investigation of an accident may be subject to administrative sanctions.

I that the information on this form *(Sections I thru VIII)* is correct to the best of my knowledge and belief.

71a. NAME AND TITLE OF DRIVER	71b. DRIVER'S SIGNATURE AND DATE

SECTION X - DETAILS OF TRIP DURING WHICH ACCIDENT OCCURRED

72. ORIGIN	73. DESTINATION

74. EXACT PURPOSE OF TRIP

	DATE	TIME *(Circle one)*		DATE	TIME *(Circle one)*
75. TRIP BEGAN		a.m. p.m.	76. ACCIDENT OCCURRED		a.m. p.m.

77. AUTHORITY FOR THE TRIP WAS GIVEN TO THE OPERATOR

☐ ORALLY ☐ IN WRITING *(Explain)*

78. WAS THERE ANY DEVIATION FROM DIRECT ROUTE

☐ NO ☐ YES *(Explain)*

79. WAS THE TRIP MADE WITHIN ESTABLISHED WORKING HOURS

☐ YES ☐ NO *(Explain)*

80. DID THE OPERATOR, WHILE ENROUTE, ENGAGE IN ANY ACTIVITY OTHER THAN THAT FOR WHICH THE TRIP WAS AUTHORIZED

☐ NO ☐ YES *(Explain)*

81. COMPLETED BY DRIVER'S SUPERVISOR	a. DID THIS ACCIDENT OCCUR WITHIN THE EMPLOYEE'S SCOPE OF DUTY ☐ YES ☐ NO	b. COMMENTS

82a. NAME AND TITLE OF SUPERVISOR	82b. SUPERVISOR'S SIGNATURE AND DATE	82c. TELEPHONE NUMBER
		( )

SECTION XI - ACCIDENT INVESTIGATION DATA

3. DID THE INVESTIGATION DISCLOSE CONFLICTING INFORMATION. ☐ YES ☐ NO *(If "Yes", explain below.)*

84. PERSONS INTERVIEWED

NAME	DATE	NAME	DATE
a.		c.	
b.		d.	

85. ADDITIONAL COMMENTS *(Indicate section and item number for each comment.)*

SECTION XII - ATTACHMENTS

LIST A ACHMENTS TO THIS REPORT

SECTION XIII - COMMENTS/APPROVALS

86. REVIEWING OFFICIAL'S COMMENTS

87. ACCIDENT INVESTIGATOR	88. ACCIDENT REVIEWING OFFICIAL
a. SIGNATURE AND DATE	a. SIGNATURE AND DATE
b. NAME *(First, middle, last)*	b. NAME *(First, middle, last)*
c. TITLE	c. TITLE
d. OFI	d. OFFICE
e. OFFICE TELEPHONE NUMBER ( )	e. OFFICE TELEPHONE NUMBER ( )

SUPERVISORS' REPORT OF MISHAP & INVESTIGATION

(FOR OFFICIAL USE ONLY. THIS IS A GENERAL USE SAFETY INVESTIGATION REPORT TO BE USED FOR SAFETY PURPOSES AS DEFINED IN OPNAVINST 5100.23E)

DATE OF REPORT:_____ TIME OF REPORT:_____ DATE OF INJURY/MISHAP:_____

_____ _____ _____ _____
Name of Injured SSN Command UIC

CIVILIAN:___ MILITARY:___ SEX: M F _____ _____ _____
Rank/Rate/Series/Grade Age Work Shift Hours

_____ _____ _____
Job Title PM/Department Work Center

_____ YES:__ NO:__ _____ San Diego Coronado Pt Loma
Name of Person Making Report Supervisor Phone #

TYPE OF MISHAP: PERSONAL INJURY___ PROPERTY DAMAGE:___ MOTORCYCLE:___ PRIVATE VEHICLE:___

CHEMICAL:___ GOVERNMENT VEHICLE:___ OCCUPATIONAL INJURY:___ OCCUPATIONAL ILLNESS:___

TIME OF MISHAP:_____ DAY OF MISHAP:_____(Mon, Tue, Wed, etc.) ON DUTY:___OFF DUTY:___

LOCATION OF MISHAP: ON BASE:___ OFF BASE:___ BLDG#:_____ W/C:_____

DRIVER(S) OF MOTOR VEHICLE(S):_____

MOTOR VEHICLE ACCIDENT STANDARD FORM 91 FILLED OUT? YES___ NO:___ (Attach copy to this form)

NATURE OF INJURY/PROPERTY DAMAGE:_____

HOW MISHAP OCCURED:_____

_____

_____

MEDICAL TREATMENT: YES:___ NO:___ DATE:_____ WHERE:_____

RECORDED WITH BASE DISPENSARY: YES:___ NO:___

COMPENSATION FORM USED: CA-1 CA-2 NONE

LOST TIME EXPECTED: YES:___ NO:___ #DAYS:_____ SICK IN QUARTERS: #DAYS:_____
(Military Only)

LIGHT DUTY ASSIGNMENT: YES:___ NO:___ #DAYS:_____

HOSPITALIZATION REQUIRED: YES:___ NO:___ #DAYS:_____

RETURN VISIT: YES:___ NO:___ WHERE:_____

CORRECTIVE ACTIONS/COMMENTS:_____

_____

_____

REPORT RECEIVED BY: _____
(Print Name) NAVOSH Representative Date/Time

EMPLOYEE STATUS: Perm:___ Temp:___ LENGTH OF EXPERIENCE AT TASK PERFORMED: _____

INJURY DESCRIPTION (i.e. Leg, sprained/left foot) and SPECIFIC JOB/ACTIVITY INDIVIDUAL WAS ENGAGED IN AT TIME OF MISHAP: _____

LESSONS LEARNED: _____

WITNESSES:

Name	Code	Phone Number

Supervisor Signature	Date	Phone Number
Safety Coordinator Signature	Date	Phone Number
Department Head Signature	Date	Phone Number
EDCSF AOR Representative Signature	Date	Phone Number

APPENDIX 14-A
SUPERVISORS' INVESTIGATION OF MISHAP

SUPERVISORS' INVESTIGATION OF MISHAP
COMNAVREGSW 5100/26 (10-98)

From: To: NAVOSH Via: Report No. (NAVOSH)

Name and Code of Injured or Operator of Vehicle: Sex: Age: Date of Mishap: Time:

Injured or Operator is ("X" One):

Military on Duty ( ) Civilian (Navy) ( ) Full Time ( ) Other ( )
Military off Duty ( ) Civilian (NAF) ( ) Part Time ( ) Contractor ( )

Type of Mishap or Injury ("X" as Applicable):

Injury on the Job ( ) Illness ( ) Chemical Exp. ( ) Motor Vehicle ( )
Sports Injury ( ) Home Injury ( ) Property Damage ( )

Injury/Illness Data (Military/Civilian/Other):

Occupation_____ Geographical location of mishap_____
Dept/Workcenter_____ Regional Complex_____
Rank/Rate/Series/Grade_____ Date stopped work_____
Social Security No._____ Date returned to work_____

Nature of Injury/Illness_____

Months Experience at time of Mishap/Illness_____ Medical attention: Yes ( ) No ( )
Day(s) away from normal work_____ Number of days hospitalized_____
Day(s) restricted duty_____ Return visit to medical for follow-up: Yes ( ) No ( )

Description of Mishap/Illness (Attach continuation sheet if necessary):

Corrective Action Taken or Proposed (Attach continuation sheet if necessary):

Motor Vehicle Data:

GMV License Number_____ Year_____ Model_____ Body Style_____
PMV License Number_____ Year_____ Model_____ Body Style_____
Motorcycle License Number_____ Year_____ Body Style_____ CC_____

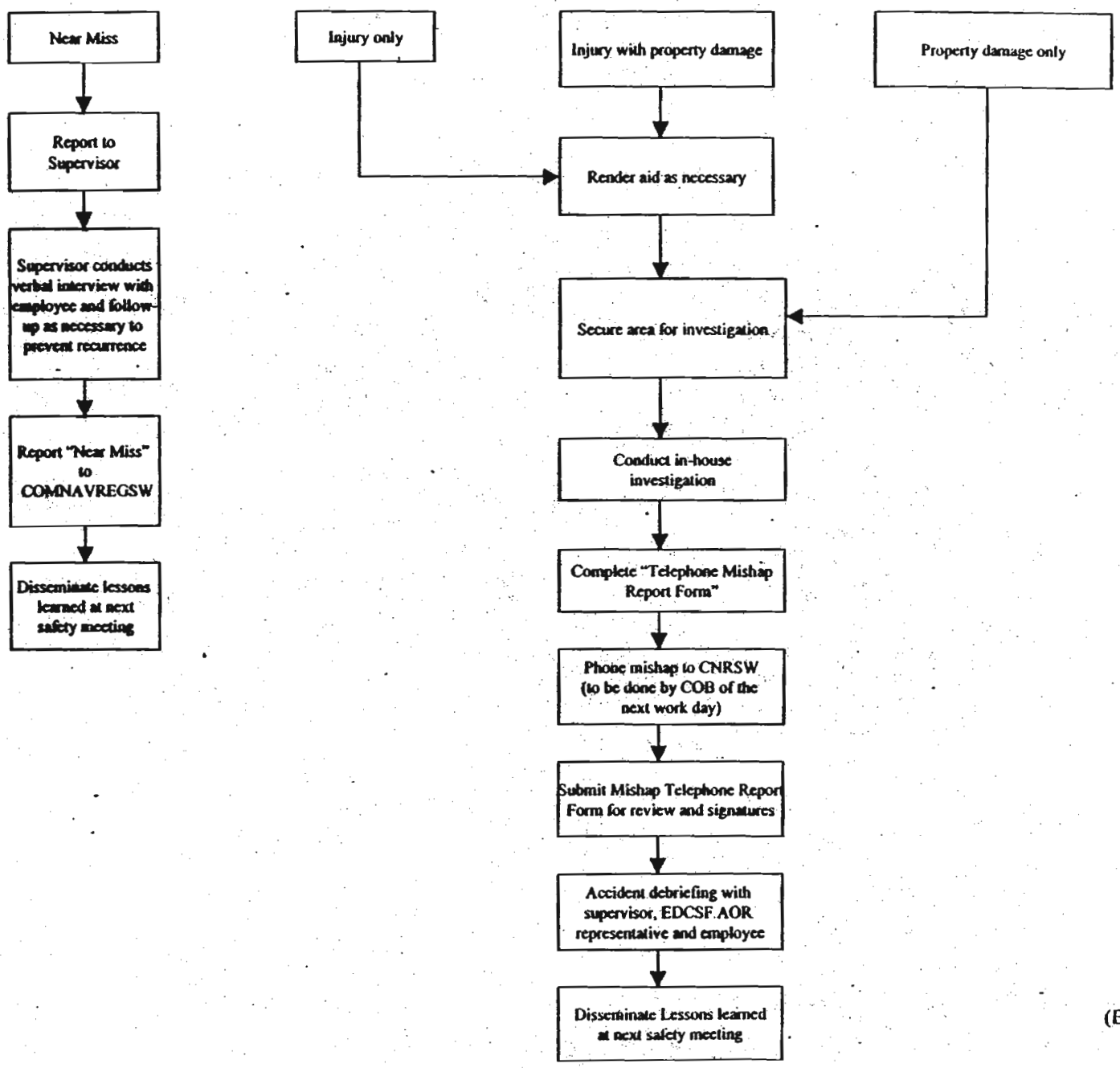
Motor Vehicle/Property Damage (Estimate in dollars):

Date: Typed Name and Signature of Supervisor: Date: Typed Name and Signature of Department Head:

Phone No:

(Enclosure 3)

Mishap Procedural Flow Chart



(Enclosure 4)

HAZARDOUS WASTE SPILL REPORT FORM

PWC-6DE90-11300/13 8-88 (FRONT)

FEDERAL FIRE DEPARTMENT NOTIFIED: YES ☐ NO ☐

CODE 900 CONTROL NO.:	REPORT DATE:	REPORT TIME:
PERSON REPORTING SPILL:	REPORTING ACTIVITY/CODE/SHIP/UIC:	TELEPHONE NO.:
MATERIAL SPILLED:	QUANTITY SPILLED:	POTENTIAL QUANTITY:
DATE OF SPILL:	TIME OF SPILL:	DURATION OF SPILL:
LOCATION OF SPILL (BASE):	BUILDING/PIER NO.:	MEDIA AFFECTED:

POTENTIAL HAZARDS:

CAUSE OF SPILL:

SPILL SCENE DESCRIPTION:

ACTION TAKEN:

FUTURE ACTION:

NOTIFICATIONS

NRC CONTROL NO.: | OES CONTROL NO.:

ORGANIZATION NAME	REPRESENTATIVE	DATE	TIME

NAME OF RECORDER (DUTY DESK/SCHEDULER): | TELEPHONE NO.:

AGENCY NAME	AGENCY REPRESENTATIVE	DATE	TIME

ADDITIONAL DIRECTIONS FROM AGENCIES:

MITIGATION MEASURES:

FUTURE ACTION:

HEALTH RISKS:

EXTREMELY HAZARDOUS: ☐ YES NO | REPORTABLE QUANTITY: EHS CERCLA TRI

OTHER INFORMATION:

NAME OF CODE 951 REPRESENTATIVE: | TELEPHONE NO.:

ATTACHMENT D: DAILY SITE LOG/COMPLIANCE AGREEMENT FORM

**All site personnel must sign below indicating they have read and understand this site plan and its provisions.

I have read and understand this Site Health and Safety Plan and hereby agree to comply with all safety requirements outlined herein.

Name (Print & Signature) Company/Date

ATTACHMENT E – OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

ATTACHMENT E –TABLE 4.1 – OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

Contaminant	ACGIH TLV (ppm)	NIOSH REL (ppm)	OSHA Ceiling (ppm)	OSHA PEL (ppm)	OSHA STEL (ppm)	NIOSH/OSHA IDLH (ppm)	Ionization Potential (eV)	Routes of Exposure	Symptomology Acute/Chronic
Tetrachloroethylene Common name PERK, perchloroethylene	25	100	200	100	300* *Peak 5min in any 2hrs	150	9.32	Inhalation Ingestion Contact Skin Absorption	Eye and mucus membrane irritant, nose, throat Vertigo, dizziness, incoordination, headache Somnolence, skin redness, liver damage (CARC) Nausea, flush face, neck
Benzene[a]	10	0.1	15	1	5* *10min peak in any 8hrs	500	9.24	Inhalation Ingestion Contact Skin Absorption	Eye, nose, and respiratory tract irritant; giddiness headache; nausea; staggered gait; fatigue; anorexia; lassitude; dermatitis; bone marrow depressant; CARCINOGEN
Ethylbenzene[b]	100	100	N/A	100	125* *15min peak in any 2hrs	800	8.76	Inhalation Ingestion Contact	Eye and mucus membrane irritant; headache; dermatitis; narcosis; coma.
Toluene[b,c]	50	100	300	200	300* *10min max peak per 8hr shift	500	8.82	Inhalation Ingestion Contact Skin Absorption	Fatigue, weakness, confusion, euphoria, dizziness, headache, dilated pupils, lacrimation, nervousness, insomnia, paresthesia, dermatitis.
Xylene,[b,c] isomers	100	100	N/A	100	150* *15min peak in any 2hrs	900	8.44-8.56	Inhalation Ingestion Contact Skin Absorption	Dizziness; excitement; drowsiness, uncoordi- nation, staggering gait; eye, nose, throat irritant; corneal vacuolization; anorexia, nausea, vomiting; abdominal pain; dermatitis.
Methyl tert-Butyl Ether (MTBE)	40[d]	N/A	N/A	N/A	N/A	N/A	N/A	Inhalation Ingestion	Loss of appetite, excessive thirst and fatigue. Dangerous fire and explosion hazard.

Notes:
a The lower value of the two is represented in this table.
b Common petroleum constituent.
c Common constituent of paint.
d Common industrial solvent.
e Not available.
f NIOSH-considered carcinogen.
g TFH is represented as gasoline in this table.
h Values are expressed in milligrams per cubic meter.
i Asbestos has remote potential that it may be present at the site.
j Values are expressed in fibers per cubic centimeter of air.
k Represents the possible pesticides used at the site.

ATTACHMENT E –TABLE 4.1 – OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

Contaminant	ACGIH TLV (ppm)	NIOSH REL (ppm)	OSHA Ceiling (ppm)	OSHA PEL (ppm)	OSHA STEL (ppm)	NIOSH/OSHA IDLH (ppm)	Ionization Potential (eV)	Routes of Exposure	Symptomology Acute/Chronic
								Contact Skin Absorption	
1,1,1-Trichloroethane[d] (1,1,1-TCA)	350	10	N/A	350	1910* *15min peak in any 2hrs	700	11	Inhalation Ingestion Contact	Headache; lassitude; central nervous system (CNS) depressant; poor equilibrium, eye irritant; dermatitis; cardiac arrhythmia.
JP-4 (Naptha)	N/A	100	N/A	100	N/A	10,000	N/A	Inhalation Ingestion Contact	Light headedness; drowsiness; eye, nose, and skin irritant; dermatitis.
JP-5	See Benzene								
1,2-Dichloroethane[d] (DCA)	10	1Ca[f]	100	50	200* *5min peak in any 3hrs	3,000	11.04	Inhalation Ingestion Contact Skin Absorption	CNS depressant; nausea; vomiting; eye irritant, corneal opacity; CARCINOGEN
Methylene[c] Chloride	50	Ca	N/A	25	125* *5min peak in any 2hrs	2,300	11.32	Inhalation Ingestion Contact	Fatigue; weakness; sleepiness; light-headedness; limbs numb, tingling; headache; nausea; eye and skin irritant; CARCINOGEN.
Trichloroethylene[d]	50	Ca[f]	200	100	200/300* *5min peak in any 2hrs	1,000	9.45	Inhalation Ingestion Contact	Headache, vertigo; visual disturbance; tremors; somnolence; nausea; vomiting; eye irritant; dermatitis; cardiac arrhythmia; paresthesia; CARCINOGEN
Diesel Fuel	N/A	N/A	N/A	300	N/A	10,000	N/A	Inhalation Ingestion Contact	Nephrotoxicity; eye, skin, and respiratory tract irritant.

Notes:
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d Common industrial solvent.
e Not available.
f NIOSH-considered carcinogen.
g TFH is represented as gasoline in this table.
h Values are expressed in milligrams per cubic meter.
i Asbestos has remote potential that it may be present at the site.
j Values are expressed in fibers per cubic centimeter of air.
k Represents the possible pesticides used at the site.

ATTACHMENT E –TABLE 4.1 – OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

Contaminant	ACGIH TLV (ppm)	NIOSH REL (ppm)	OSHA Ceiling (ppm)	OSHA PEL (ppm)	OSHA STEL (ppm)	NIOSH/OSHA IDLH (ppm)	Ionization Potential (eV)	Routes of Exposure	Symptomology Acute/Chronic
Fuel Oil	N/A	N/A	N/A	100	N/A	10,000	N/A	Inhalation Ingestion Contact	Light headedness; eye, nose, and skin irritant; dermatitis.
Total fuel hydrocarbons[g] (TFH)	300	Ca	N/A	300	500	N/A	N/A	Inhalation Ingestion Contact	CNS depressant; eye, nose and throat irritant; dermatitis; headache.
4,4'-DDT[h]	1	0.5	N/A	1	N/A	500	N/A	Inhalation Ingestion Contact Skin Absorption	Tongue, lips, and face paresthesia; dizziness; headache; vomiting; eye and skin irritant; tremor.
Chlordane[h,k]	0.5	0.5	N/A	0.5	N/A	100	N/A	Inhalation Ingestion Contact Skin Absorption	Blurred vision; confusion; ataxia; delirium, coughing; abdominal pain; nausea; vomiting; diarrhea; tremors, convulsions; anuria. in animals: lung,liver, kidney damage.
Arsenic[c,h]	0.01	Ca	N/A	.5*/.01**	0.002***	5	N/A	Inhalation Ingestion	Ulceration of nasal septum; gastrointestinal disturbances; respiratory irritation; skin hyper-pigmentation; CARCINOGEN.
				*Organic Compounds **Inorganic Compounds ***15min max peak any 2hrs					
Beryllium[c,h]	0.002	0.005	0.005	0.025*	0.002	N/A	N/A	Inhalation Ingestion	Berylliosis; abnormal low-weight; weakness; chest pain; cough; clubbing of fingers; cyanosis; pulmonary insufficiency; eye irritant; CARCINOGEN.
					*30min peak per 8hr shift				
Chromium[c,h]	0.01	0.001	0.1* *as Chromates	0.1*	N/A	15	N/A	Inhalation Ingestion Contact	Irritation to eyes; fibrotic changes to lungs; dermal sensitization; CARCINOGEN.

Notes:
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c Common constituent of paint.
d Common industrial solvent.
e Not available.
f NIOSH-considered carcinogen.
g TFH is represented as gasoline in this table.
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Contaminant	ACGIH TLV (ppm)	NIOSH REL (ppm)	OSHA Ceiling (ppm)	OSHA PEL (ppm)	OSHA STEL (ppm)	NIOSH/OSHA IDLH (ppm)	Ionization Potential (eV)	Routes of Exposure	Symptomology Acute/Chronic
Cadmium[c,h]	0.01[(total)] 0.002 [(resp)]	Ca	N/A	0.005	N/A	9	N/A	Inhalation Ingestion	Pulmonary edema; dyspnea; cough; tight chest; pain; headache; chills; muscle ache; nausea; vomiting; diarrhea; mild anemia; CARCINOGEN.
Copper[c,h] dusts & mists	1	0.1* *fume	N/A	1	N/A	100* *fume	N/A	Inhalation Ingestion Contact	Irritation to eyes and upper respiratory system; metallic taste; dermatitis in animals; lung, liver, kidney damage; anemia.
Lead[c,h] elemental & inorganic compounds	0.05	0.1	N/A	0.05	N/A	100	N/A	Inhalation Ingestion Contact	Weakness; insomnia; facial pallor; pale eye; anorexia; stomach pain; constipation; colic; anemia; tremor; limp wrist, encephalopathy; neuropathy.
Thallium[c,h]	0.1	0.1	N/A	0.1	N/A	15	N/A	Inhalation Absorption Ingestion Contact	Nausea, diarrhea, abdominal pain, vomiting; strabismus; peripheral neuritis; tremos, chest pain; pulmonary edema; psychosis; liver, kidney damage; alopecia.
Zinc[c,h]	10	5[(fume)] 15[(total)] 10[(dust)]		5[(resp)]	15* *15min in any 2hrs as dust	500	N/A	Inhalation	Metal fume fever; chills; muscle ache, nausea, fever; dry throat, cough, weakness; lassitude; metallic taste; headache; blurred vision; low back pain; vomiting; fatigue; tight chest, dyspnea, rales, decreased pulmonary function.
Asbestos[i,j]	0.2-2 f/cc	0.1	N/A	0.1-2.0	1 f/cc* *30-min	Ca[f]	N/A	Inhalation Ingestion	Dyspnea, interstitial fibrosis; restricted pulmonary function, finger clubbing; CARCINOGEN

Notes:
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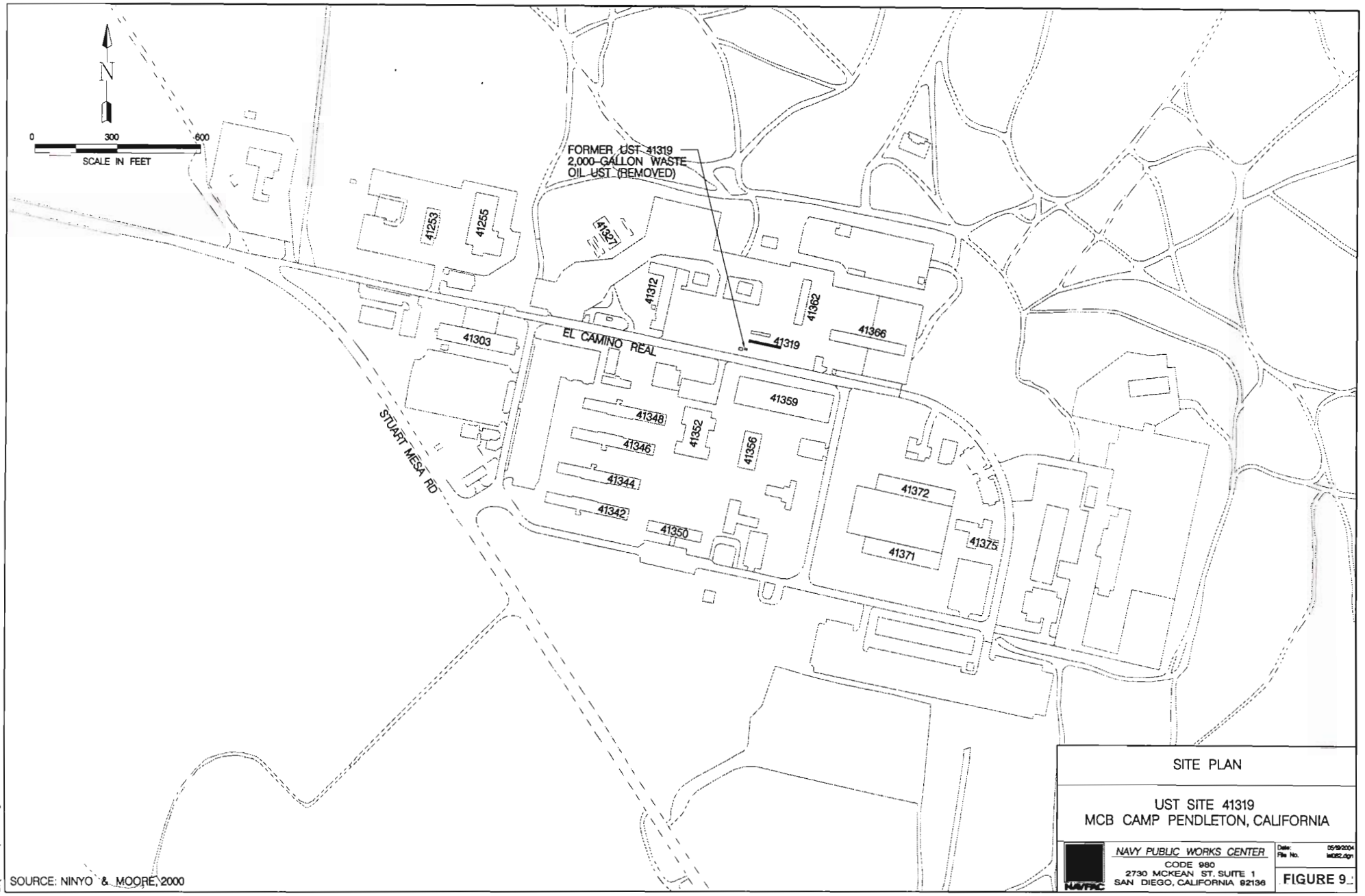
- b Common petroleum constituent.
- c Common constituent of paint.
- d Common industrial solvent.
- e Not available.
- f NIOSH-considered carcinogen.
- g TFH is represented as gasoline in this table.
- h Values are expressed in milligrams per cubic meter.
- i Asbestos has remote potential that it may be present at the site.
- j Values are expressed in fibers per cubic centimeter of air.
- k Represents the possible pesticides used at the site.

ATTACHMENT E –TABLE 4.1 – OCCUPATIONAL HEALTH GUIDELINES AND TOXICOLOGICAL INFORMATION

Contaminant	ACGIH TLV (ppm)	NIOSH REL (ppm)	OSHA Ceiling (ppm)	OSHA PEL (ppm)	OSHA STEL (ppm)	NIOSH/OSHA IDLH (ppm)	Ionization Potential (eV)	Routes of Exposure	Symptomology Acute/Chronic
									with latency period of 20 or more years.
PCBs	N/A	Ca	N/A	N/A	N/A	N/A	N/A	Contact Inhalation	Dermatitis; CARCINOGEN
Freon 113[d]	1,000	1,000	2,000	1,000	1,250	2,000	11.99	Inhalation Ingestion Contact	Throat irritation; drowsiness; dermatitis.
Oil (mist)[h]	5	5	N/A	5	10* *15min peak in any 2hrs	2,500	N/A	Inhalation	None reported.

Notes:				
	a	The lower value of the two is represented in this table.	f	NIOSH-considered carcinogen.
	b	Common petroleum constituent.	g	TFH is represented as gasoline in this table.
	c	Common constituent of paint.	h	Values are expressed in milligrams per cubic meter.
	d	Common industrial solvent.	i	Asbestos has remote potential that it may be present at the site.
	e	Not available.	j	Values are expressed in fibers per cubic centimeter of air.
			k	Represents the possible pesticides used at the site.



SITE PLAN

UST SITE 41319
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 05/19/2004
File No. ist082.dgn

FIGURE 9

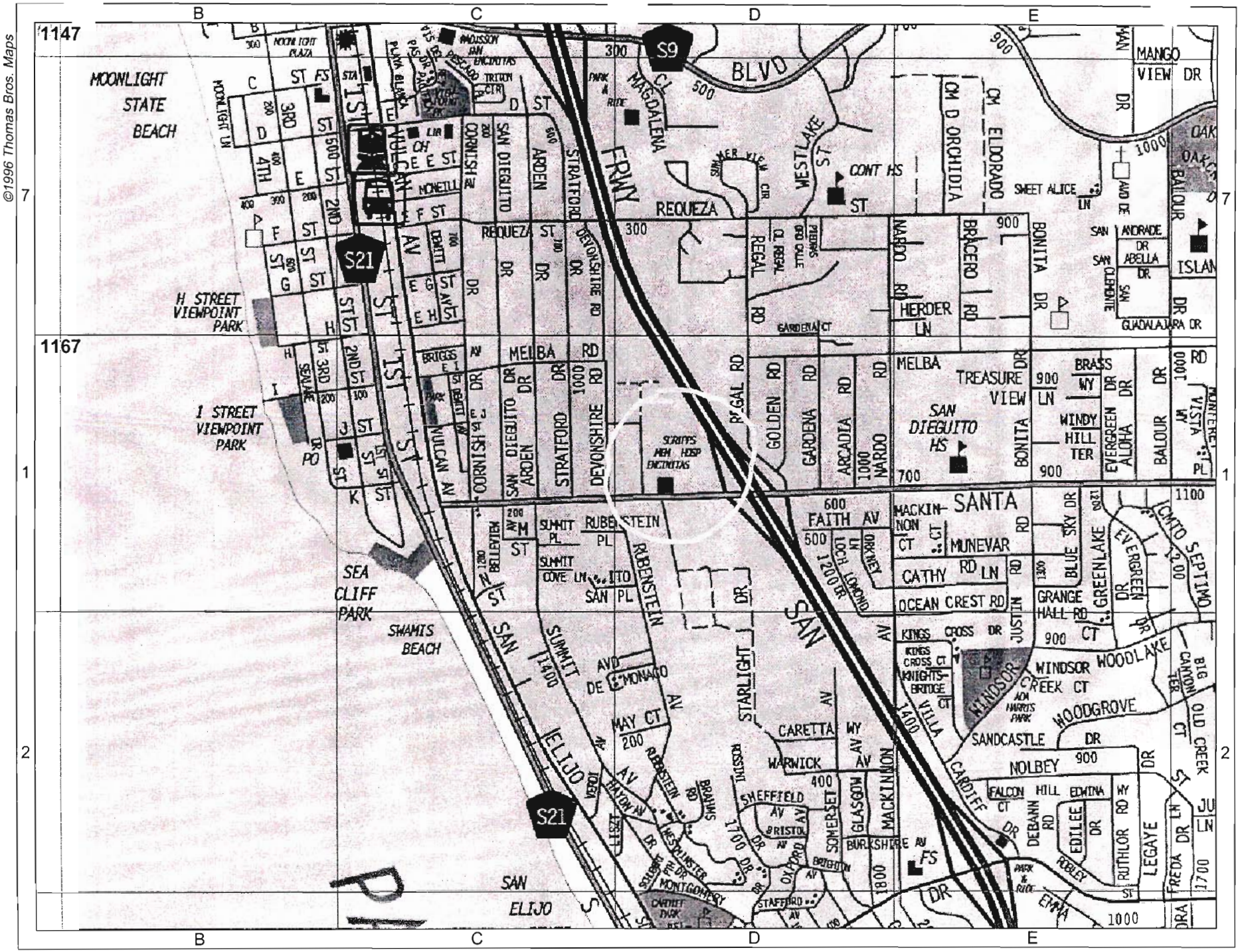
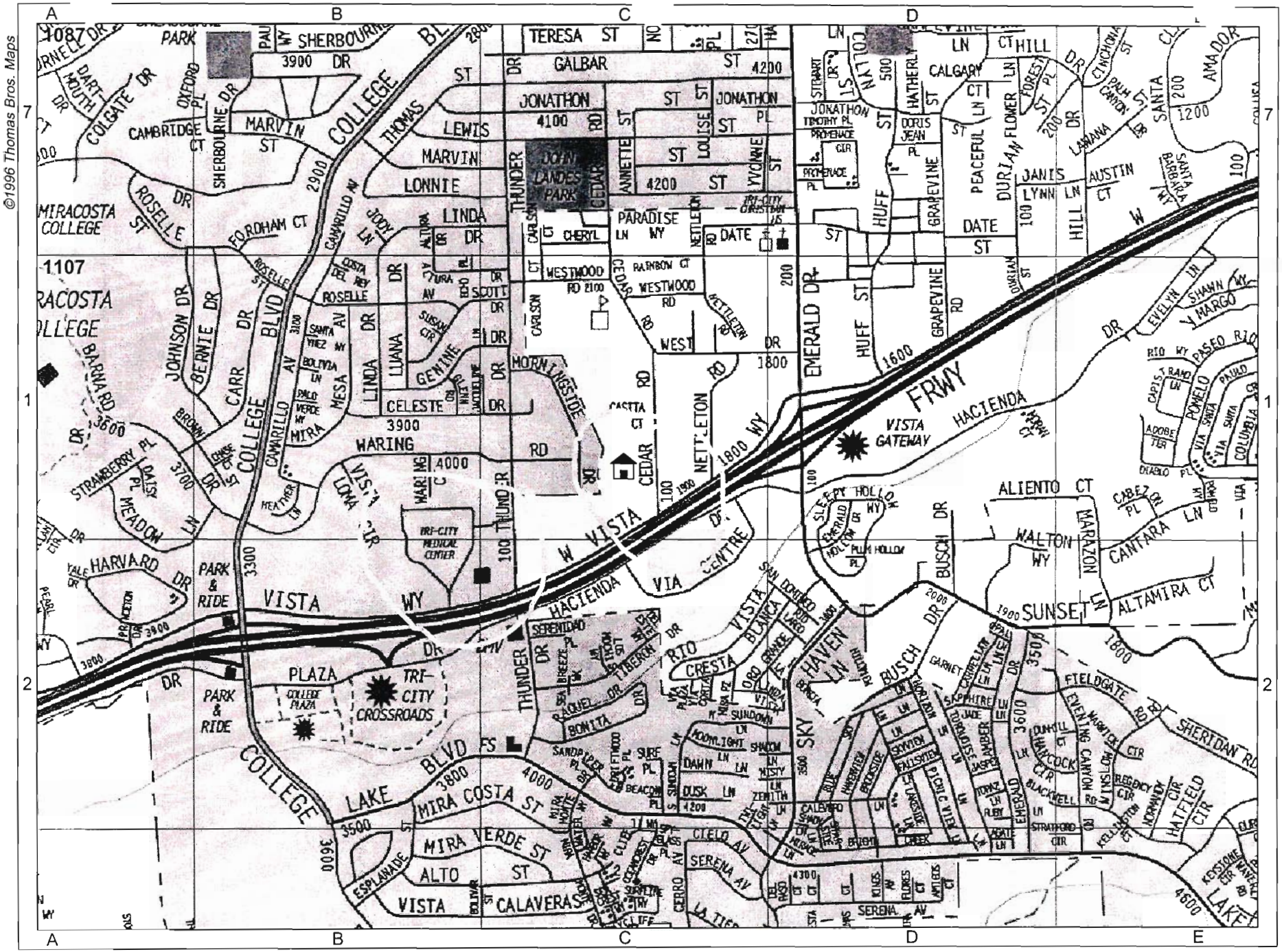


FIGURE 2



130 Cedar Rd, Vista, 92083, Page & Grid 1107 C1

FIGURE 3

FIGURES

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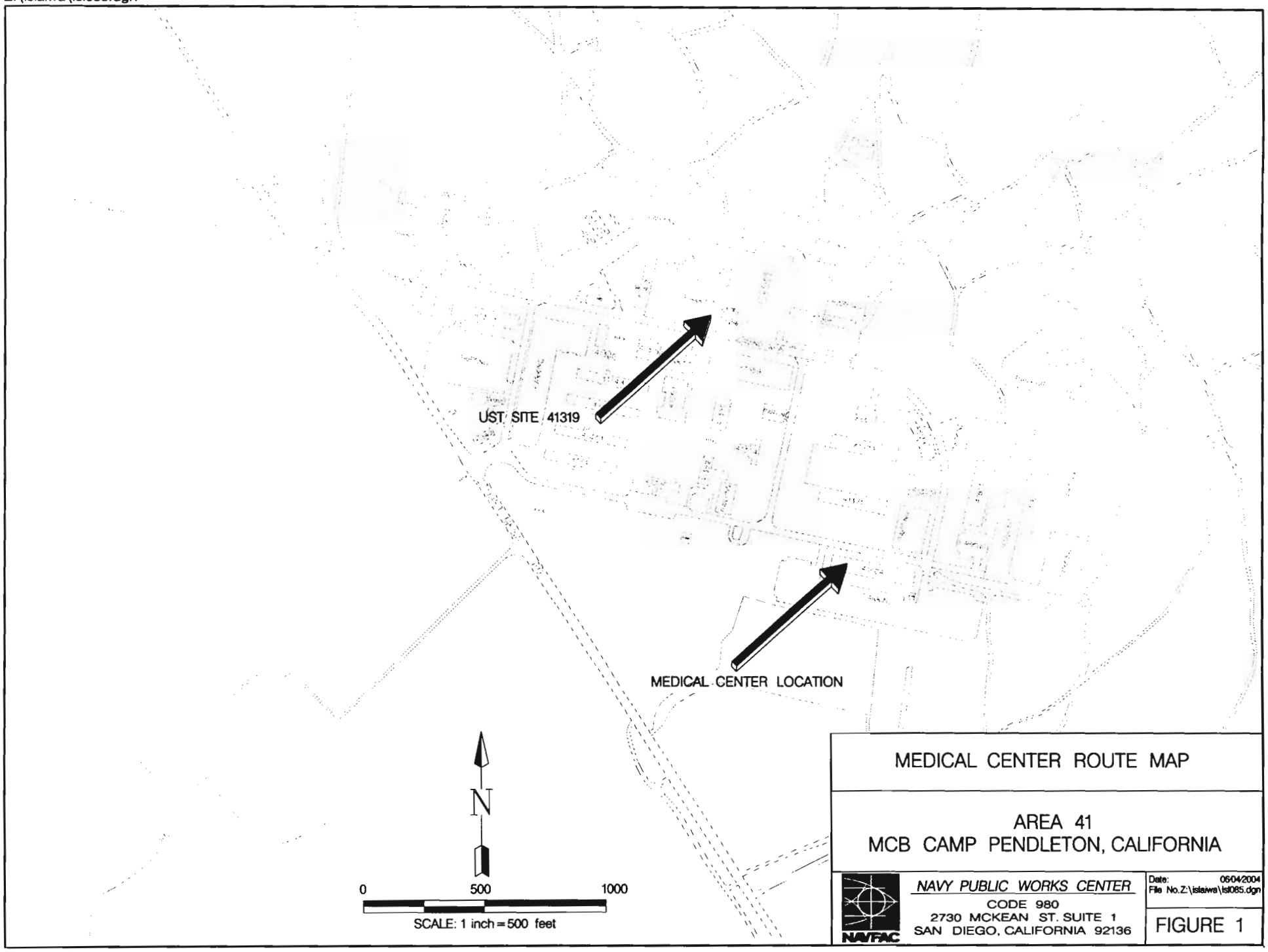


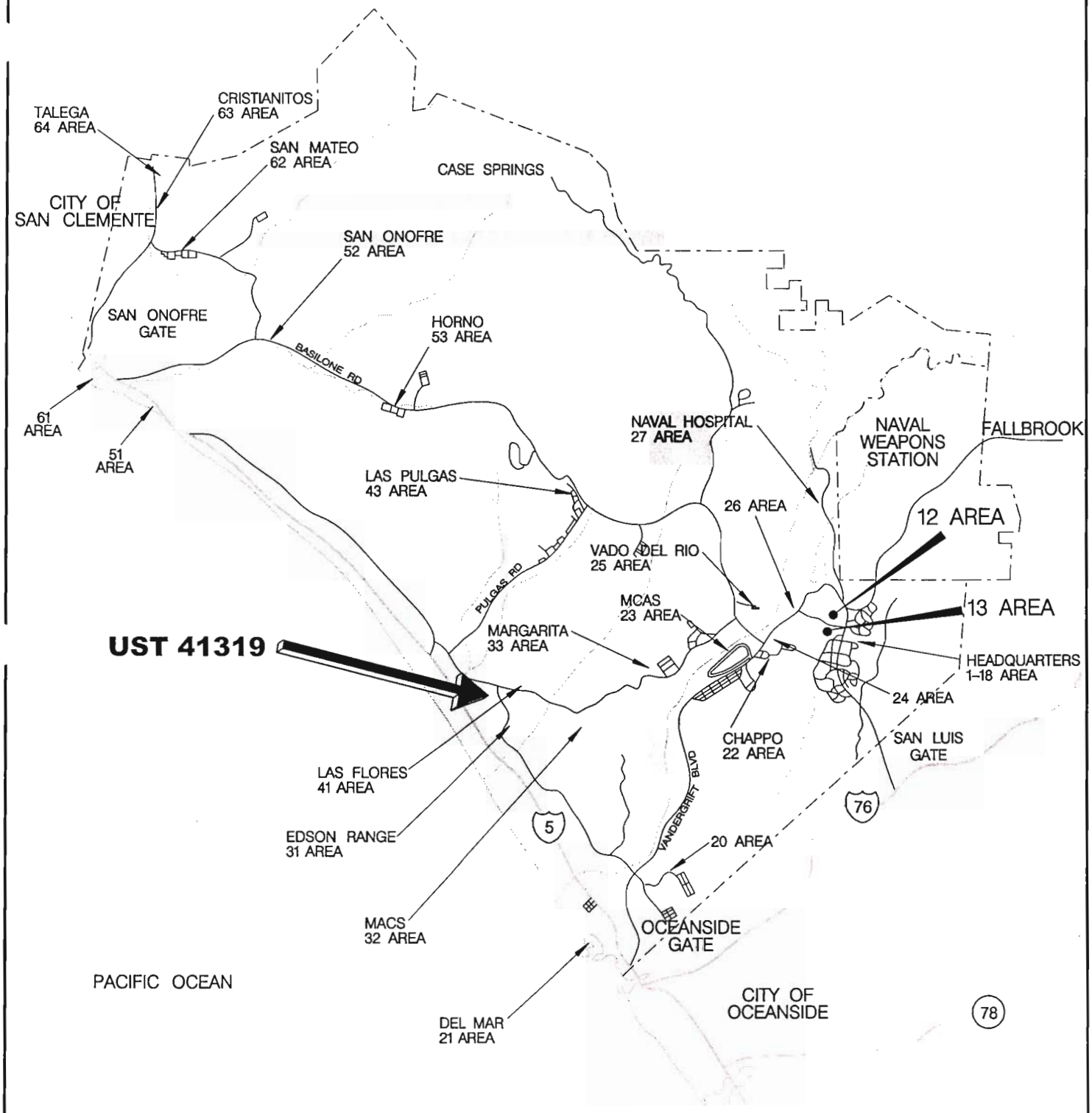
MEDICAL CENTER ROUTE MAP

AREA 41
MCB CAMP PENDLETON, CALIFORNIA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 06/04/2004
File No.Z:\islaiwa\isl085.dgn

FIGURE 1



REGIONAL LOCATION

Former Bldg 41319 UST

MARINE CORPS BASE
CAMP PENDLETON, CA

NAVY PUBLIC WORKS CENTER
CODE 980
2730 MCKEAN ST. SUITE 1
SAN DIEGO, CALIFORNIA 92136

Date: 07/17/2003
File No. isl039.dgn

FIGURE 8

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